PRELIMINARY ASSESSMENT
GENERAL ELECTRIC PRECISION
PROTECTIVE DEVICES
RIO GRANDE, PUERTO RICO
VOLUME I

PREPARED BY
ENVIRONMENTAL QUALITY BOARD
SUPERFUND PA/SI PROGRAM

SEPTEMBER 14, 1990

# SITE SUMMARY AND RECOMMENDATIONS

General Electric Precision Protective Devices, Inc. (GEPPD) actually known as Caribe General Electric Products, Inc. - Palmer is a wholly owned subsidiary of General Electric Company and is located at Road 191 km. 0.8, Palmer town at Río Grande Municipality. It is engaged in the manufacture of residential and industrial circuit breakers. The process consists of manufacturing the metal pieces, molding of the plastic to make the outer case and assembling these parts together to make the breaker. Prior to the assembling step, the metal pieces are cleaned with thinner and Varsol, to remove oil and debris.

The GEPPD facility consists of a building with approximately 92,000 square feet of office and operations area situated on approximately 9 acres of land. The site is divided by Highway 191 with the manufacturing plant on the west and the wastewater lagoons on the east. GEPPD have two waste unit facility that are regulated by RCRA, knowns as the hazardous waste storage area and surface impoundments area, which was filed as a SO1 (container) and SO4 (surface impoundment) unit, respectively. The facility is regulated under Generator and TSF classification by Environmental Quality Board (EQB) and the Environmental Protection Agency (EPA).

The hazardous waste storage area is located at the south-east corner of the facility, outside of the main building plant. It is equipped with a small pit for containing of releases, spill control equipment, impermeable concrete base and secondary containment. At this moment, the storage area is used to store Lacquer thinner, Varsol and oil wastes, some of them flammable liquid which are considered hazardous wastes.

The surface impoundments area, consisted of two lagoons or drying beds, was located in the eastern portion of the plant property, along the western bank of the Mameyes river. These units have not been used since 1983. The lagoons were designed with a baffle system to provide resident time and allow settlement of particulates from electroplating waste treatment operations. the other hand, the two surface impoundments were not protected by any artificial cover or liner. GEPPD submitted a Closure Plan for these units to EPA and EQB and was approved on June 27, 1989 for them. The closure activities began on 1990 and the firm Law Environmental was contracted to perform the closure operations. As soon as the closure activities are finishing, GEPPD will perform a years post-closure groundwater monitoring study prior demonstrating clean closure and obtaining final closure approval from EQB and EPA.

Until 1981, GEPPD operated an electroplating operation as part it manufacturing process. The electroplating operations consisted of both an automatic and manual production lines and the electroplating area was located in the southeast corner of the plant. The former electroplating operation included a wastewater treatment system to perform basic operations such as cyanide destruction, chromate reduction, and pH adjustment. The untreated effluent from the plating tanks, located on the west side of the manufacturing area, mounted on slatted platforms, was collected in a sump and pumped into the wastewater treatment tanks (connected to the neutralization system) adjacent to the plating room. treated effluent was then discharged to the impoundments through an underground pipe (4-in diameter vitrified clay) that traversed the parking lot and Road 191 to a diversion box and into one of the lagoons. In the lagoons, the resulting sludge was contained high concentrations of metals and was designated as hazardous waste

under RCRA (F006). Then, the wastewater discharge from the former treatment area through the impoundments was gravity driven to the Mameyes river. The entire electroplating area was surrounded by a concrete drainage conduit to prevent runoff. The holding tanks and an additional tank had been provided surplus capacity in the event of multiple tank failures. Also, the neutralization system was connected to an alarm system and automatic rinse water shut-off valve. The system was designed to eliminated accidental discharges of unneutralized plating solutions to precipitation lagoons.

GEPPD eliminated the electroplating operations of its manufacturing process on 1981 and the complete electroplating system, as well as the existing wastewater treatment plant along electroplating raw materials, were sold to Electroplating, Inc. plant located at Dorado, Puerto Rico. The plating solutions were removed to General Electric Gepol, Inc. in Arecibo, P.R. (an affiliate of GEPPD) and were rehused in Gepols manufacturing operations. In addition, the EQB was never informed of the closure of the electroplating tanks system notified in their Part A dated October 16, 1980.

The hazardous wastes generated by the manufacturing process of the facility are collect by Safety-Kleen Envirosystem Co. of Puerto Rico and dispose them in their Manatí facility. The sludge removed from the lagoons, as part of the closure activities performed on them, is disposed at an industrial landfill in Cecos International, Livingston, Louisiana. The rainwater accumulated in the lagoons is removed using a pump and filtered to remove suspended solids, then is accumulated in tanks, pumped to a tank truck and disposed at PRASA - Puerto Nuevo Plant. At March 30, 1990, 58 shipments of sludge waste (F006) have been made.

As additional information, a RCRA Facility Assessment (RFA) of the GEPPD Palmer Plant was performed by Science Applications International Corporation under contract to U.S. EPA Region II. The RFA was reported to the Agency on August 4, 1986; nevertheless, a copy of this RFA is no available at present in EQB and EPA Caribe Offices.

At present, GEPPD is not storage great amounts of hazardous substances and the existing waste unit facility (hazardous waste adequate management practices. storage area) observed Nevertheless, based on the potential surface soil contamination associated with past surface disposal of sludge at different parts of the plant area, besides on a documented cadmium contamination in one of their water quality monitoring wells located in the surface impoundments area, the past poor housekeeping practices observed in the facility and the hydrogeology of the area where the GEPPD facility is located, this site is recommended for a Medium Priority Site Inspection.

# POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

# PART I: SITE INFORMATION

1.	Site Name/Alias General Electric Precision Protective Devices, Inc.  Street Road 191 km. 0.8, Palmer  City Río Grande State PR Zip 00721
2.	County Code 119
3.	EPA ID NO. PRD-090037276
4.	Latitude 18º 22' 10" Longitude 65º 46' 20"  USGS Quad El Yunque
5.	Owner General Electric Precision Protective Devices, Inc. Tel. No. (809) 887-2050 Street Road 191 km. 0.8, Palmer City Río Grande State PR Zip 00721
6.	Operator Caribe General Electric Products, Inc. Tel. No. (809) 887-2050 Street Road 191 km. 0.8, Palmer City Río Grande State PR Zip 00721
	Type of Ownership  xx Private FederalState  County Municipal Unknown Other
8.	Owner/Operator Notification on File  RCRA 3001 Date CERCLA 103c Date  XX None Unknown

9. Permit Information

Permit

			-		
1. UIC	840194	08/01/84	08/01/86	See a	
2. NPDES	0000671	05/01/86	04/30/91	Discharge to	
				fflunt	e
3. RCRA	090510793	1980	Present	see b	

No. Date Issued Expiration Date

Comments

- 3. RCRA 090510793 1980 Present See b 4. AIR LC-0289-0163 03/01/89 03/01/91 Operation
  - a) On May 15, 1990, they submitted permit renovation to EQB, but this was denied.
  - b) TSD and Generator in Interim Status
- 10. Site Status

xx Active \_\_ Inactive \_\_ Unknown

- 11. Years of Operation 1956 to Present
- 12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above-or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.
  - (a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Drums	Hazardous Waste
		Storage Area
2	Lagoons	Surface Impoundments
		Area

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site;
describe the materials and identify their locations on site.

In twenty-four (24) consecutive hours National Pollutant Discharge Elimination System (NPDES) permit compliance sampling inspections performed to General Electric Precision Protective Devices (GEPPD) facility were documented continuous permit limitations violations. The following violations were documented:

- I. September 10, 1974 September 29, 1979, First round NPDES permit.
  - 1. EPA issued a Finding of Violations and legal action, "Order to Show Cause", against the permitte for violations ocurring since January 1978. One of these violations was a discharge of cyanide and chromate from an unauthorized discharge.
- II. October 31, 1980 June 30, 1985, Second round NPDES permit.
  - 1. A review of Discharge Monitoring Reports (DMR) submitted by GEPPD showed that the permittee has reported non-compliance with permit limitations in at least one occasion for cadmium, total iron, total aluminum, total disolved solids, total suspended solids, boron and total tin. Also zinc, nickel, copper and silver limitations have been reported in non-compliance on several occasions.
  - 2. The 24-hour sampling inspection carried out on October 27-28, 1981 by EQB personnel revealed that the effluent of one of the sample stations exceeded permit limitations for nickel by a compliance factor of 2.24 and tin by a

compliance factor of 4.61. Also, Water Quality Standards (WQS) for boron, copper, surfactants were violated in the station, while the WQS were violated for silver and zinc in others stations. On the other hand, the total phosphorous, aluminun, tin and iron were found in high concentrations, however, there are no applicable WQS for these parameters.

- 3. A inspection performed on November 29-30, 1983 found four unauthorized discharges (an overflow of the lagoons was one of them) that exceeded the WQSR standards for zinc, copper, silver, lead, cadmium, and total chromium.
- 4. On December 2 and 5, 1983 a inspection was performed to GEPPD by technicians from the Land Pollution Control Area and Field Sampling and Monitoring Division of the Water Quality Bureau of EQB. During this inspection it was found that the industry is not complying with the RCRA State Regulations. Most of these findings were informed as poor management practices that may represent a potential source of contamination to water bodies near the facility. Applicable legal action was requested in January 23, 1984 to EQB's legal division for violations classified as Class I while a Notice of Deficiencies was sent to GEPPD for correction of Class III violations. In the inspection was observed the following:
- a. In the containers storage area the concrete base was corroded and the dikes (secondary containment system) was filled with liquid.
- b. Approximately 12 cardboard containers of different volumes were stored and some of them were in bad conditions.

- c. In the storage area the wastes was spilled on several places and a white dust was observed inside a plastic bag, deposited on the concrete base.
- d. Spilled material was observed outside the storage area.
- e. Five drums containing electroplating sludge were opened and a small pile of electroplating sludge was disposed over the concrete base.
- f. The tanks that were used in the electroplating operations was observed in bad conditions and corroded.
- g. In the tank area, the area has not been decontaminated when the electroplating operations finished and the dikes were filled with liquid and overflowing.
- 5. On July 30, 1984 EPA issued an "Order" for findings resulting from an April 30, 1984 inspection, conducted by EPA and EQB. It was found that during rainy weather, stormwater runoff from the storage area and overflow from the lagoons containing electroplating sludges was discharge into the receiving body of water. Some others violations was included in this "Order".
- 6. The inspection carried out on November 20-21, 1985 was found that the WQSR standards were violated for surfactants, iron, total phenolic substances, lead, cadmium, zinc, copper, silver and total chromium.
- III. May 1st, 1986 at present, Third round NPDES permit.
  - 1. Review of DMR's submitted to EQB by GEPPD from May 1986 through March 1988, indicated violations of NPDES

permit effluent limitations for boron, sulfide, total suspended solids, iron, surfactants, silver, copper and zinc.

2. In the May 24-25, 1988 inspection was found that the permittee violated NPDES permit limitations for sulfide, silver, phenolic substances, cadmium, surfactants, iron, zinc, and total suspended solids.

In addition, on September 1984 GEPPD and Circuit Breakers, Inc. (other General Electric Company located in the same land property) were merged into one NPDES permit, named now Caribe General Electric Products, Inc. On the other hand, permit modifications were requested by EPA on October 29, 1984, since the new permit had not been issued by EPA and discharges remained basically the same.

Until 1981, the electroplating operation was included in the manufacturing process of the GEPPD. This operation system was composed by:

- I. Spent solution tanks:
  - a. two each 500 gallons capacity
  - b. one, 200 gallons capacity
- II. Plating process automatic line
  - a. Tank No. 2, soak clean 275 gallons capacity
  - b. Tank No. 3, electro-clean 240 gallons capacity
  - c. Tank No. 5, acid dip 200 gallons capacity
  - d. Tank No. 8, zinc plate 250 gallons capacity
  - e. Tank No. 11, acid tin 240 gallons capacity
  - f. Tank No. 14, nickel plate 470 gallons capacity
  - g. Tank No. 18, blue-brite chromate 200 gallons capacity

# III. Plating process - manual line

- a. Tank No. 1, soak clean 200 gallons capacity
- b. Tank No. 2, electro-clean 200 gallons capacity
- c. Tank No. 3, acid dip 200 gallons capacity
- d. Tank No. 4, silver plate 200 gallons capacity

# IV. Plating waste treatment

- a. Neutralization treatment tank 2,400 gallons/hr
- b. Two lagoons 76,290 gallons capacity each

As indicated in some documents, sludge from the electroplating operations at GEPPD were disposed of in a sludge disposal area next to the lagoons in a period between 1972 and 1974. Also, at least, one other different location within GEPPD property line was used to disposed of electroplating sludge, the backside area of the hazardous waste storage area. On 1985-1986 several soil samples studies were performed in the suspected waste pile areas, which samples results were:

- 1. In the lagoon waste pile, the analysis for total metals reflected highest barium concentrations at 340 to 490 mg/kg and the remaining metals having concentration below 160 mg/kg. However, is believe that the concentrations of barium reflect natural geologic conditions rather than effects of past disposal practices.
- 2. The shallow soil samples from the lagoon waste pile and the drum storage area waste pile locations contained greater amounts of cadmium, lead, nickel and zinc than did the deep samples from the same respective locations.

3. High concentrations of metals were detected in the samples collected from the sumps located along of the suspected waste pile disposal areas.

Nevertheless, in the soil samples results from the studies performed during 1989 shows that the samples collected from the above mentioned areas were non-hazardous.

In addition, an approximate total of 200 pounds of sludge from the plating tanks had on several occasions over a period of two years been placed in a drum for immediate pick up by a waste hauler. On these occasions, the hauler missed the pick up date, resulting in a small amount of sludge waste being disposed off in the area of the plant and was left there which was consequently absorbed by the soil.

Ref. Nos. 2-13

#### 13. Information available from

Contact Eng. Francisco Claudio Agency EQB Tel. No. 764-8824 Preparer Rebecca Wiscovitch Agency EQB Date September 14, 1990

#### PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 1 Drum - Hazardous Waste Storage Area

 Identify the RCRA permit status, if applicable, and the age of the waste unit.

The drum storage area was filed for as a SO1 (container) under RCRA. At this moment, the drum storage area is regulated under interin status to store certain hazardous wastes related to its processes activities by EQB and EPA. GEPPD notified EPA of it hazardous waste activity and submitted a Part A, Hazardous Waste Permit Application, prior to the 1980 deadline for existing facilities. Nevertheless, a closure of this hazardous waste storage area was performed in the past and the company submitted an amended Part A Permit Application in May 22, 1988. The waste notified was FOO6, which was generated in the past when the company operations included electroplating.

On the other hand, some documents mentioned a temporary hazardous waste storage area and other drum storage area, which were placed in the past in the same area where the actual storage area is located. The little available information about all these facilities is not clear and other necessary information to clarify the history of them is no available. In summary, the temporary hazardous waste storage area existed until 1981, when the actual storage area started operation.

Ref. Nos. 14-19

2. Describe the location of the waste unit and identify clearly on the site map.

The hazardous waste storage area is located at the south-east corner of the facility, outside of the main building and more than 50 feet away from it.

Ref. Nos. 2, 20

3. Identify the size or quantity of the waste unit (e.g. area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.

The hazardous waste storage area is a small concrete building, covering an area of approximately 300 ft 2 and a total storage capacity of 29 drums (55 gallons each); by the time of the assessment, the facility was holding 2 drums with spent solvents. The GEPPD use steel drums of 55 gallons to store their wastes, and the storage area is inspected weekly. As additional information, approximately 10 drums (steel 55 gallons each) of hazardous wastes are sent to Safety Kleen Envirosystems in Manatí, every 90 days.

Ref. Nos. 16, 20-22

4. Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.

The physical state of the waste disposed in the hazardous waste storage area is liquid. Nevertheless, when the electroplating operations was performed by the facility, the solids phase of the electroplating sludge was decanted into drums which were stored in the storage area.

Ref. Nos. 11, 14, 16, 17, 23

5. Identify specific hazardous substance(s) known or suspected to be present in the waste unit.

The specific hazardous substances known to be present in the storage area are Lacquer thinner (the main constituent is toluene) and Varsol, both classified as D001 (F005). Nevertheless, in 1984, GEPPD stored in its facility hazardous wastes such as paint residues, spent 1,1,1-trichloroethane, ignitable mixed solvents and plating bath sludges from nickel and zinc. Also, in 1981 the facility stored in the hazardous waste storage area hydrochoric acid, sulfuric acid, zinc chloride, potassium chloride, boric acid, stannus sulfate, nickel sulfate, nickel chloride, chromic acid, silver chloride and sodium hydroxide.

Ref. Nos. 11, 12, 14, 16, 24, 25

6. Describe the containment of the waste unit as if relates to contaminant migration via groundwater, surface water, and air.

The hazardous waste storage area is equipped with a small pit (75 gallons capacity) for containing of releases, spill control equipment, impermeable concrete base and secondary containment. In addition, the storage area has eye wash

station, extinguishers, and signs which forbidden smoking and non-authorized personnel in the area. All the drums were closed and labeled, besides that, the hazardous wastes containers were segregated and separated by waste type. The maintenance and authoritative personnel have been trained in the use and management of hazardous substances and in the response to an emergency. The hazardous wastes are being stored for less than 90 days.

Ref. Nos. 14, 20-22

## PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 2 Lagoons, Surface Impoundments Area

1. Identify the RCRA permit status, if applicable, and the age of the waste unit.

GEPPD facility operated two lagoons, which were filed as SO4 (surface impoundments) under RCRA and were regulated under an interin status (1980) by EQB and EPA. Both were constructed in 1956-1957 and dedicated to the storage of liquid phase of the electroplating waste water treatment sludges until 1981. Nevertheless, in a NPDES inspection carried out on December 2 and 5, 1983, was found that the lagoons were still used for the storage of bath plating sludge.

A Closure Plan for the two surface impoundments was approved on June 27, 1989 by EQB with EPA concurrence and it is implemented at present; the activities began on 1990.

Ref. Nos. 3, 4, 14, 16, 17, 20, 26

2. Describe the location of the waste unit and identify clearly on the site map.

The two surface impoundments were located in the eastern portion of the plant property, along the western bank of the Mameyes river.

Ref. Nos. 1, 2, 26

3. Identify the size or quantity of the waste unit (e.g. area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.

The surface impoundments were made with concrete blocks walls, which dimensions were about 80 feet wide and 270 feet long. The lagoons capacity was approximately 76,290 gallons each and, when the closure plan activities began, was estimated that the lagoons contained approximately 2,000 cubic yard of sludge.

Ref. Nos. 4, 16, 26

4. Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.

The physical state of the waste disposed in the surface impoundments area was liquid with suspended solids.

Ref. Nos. 4, 26

5. Identify specific hazardous substance(s) known or suspected to be present in the waste unit.

The specific hazardous substances known to have been presented in the surface impoundments were wastewater treatment sludge and primarily metal hydroxides (F006) from the electroplating operations.

Ref. Nos. 4, 11, 14, 17, 20, 23, 25, 27-30

6. Describe the containment of the waste unit as if relates to contaminant migration via groundwater, surface water, and air.

The lagoons were designed with a baffle system to provide resident time and allow settlement of particulates, primarily metal hydroxides from electroplating waste treatment operations. The two surface impoundments were no protected by any artificial cover or liner. The primary hazardous constituents that could potentially affect the groundwater and surface water in the vicinity of the lagoons are metals.

In addition, the surface impoundments had never been cleaned during 1975 to 1981 and them were full of grass and sludges.

Ref. Nos. 3, 4, 24, 26, 31

#### PART III: HAZARD ASSESSMENT

#### GROUNDWATER ROUTE

 Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

In the area of concern, it's possible to find water at 12 feet below land surface and the permeability of the stratum where the water-table is located is very permeable. hand, overlying the water-table aguifer is a sandy clayey silt stratum which appears to be continuous across the site at a depth of between 8 to 10 feet and have a moderate permeability value, condition that will be support the likelihood of a release ΟÍ contaminants the aquifer of to Nevertheless, GEPPD is not stored greater amounts of hazardous substances in the drum storage areas because the company reorganized its operation in which was discontinued the electroplating operations, besides the fact that in these areas an adequate management practices are observed.

Is important to mention that around the surface impoundments area, were installed water quality monitoring wells which were sampled quarterly. During each sampling, the water from well D2 has routinely contained cadmium levels exceeding the National Drinking Water Maximum Contaminant Level. The GEPPD attributed this results to the past leakage of the discharge line which passes near well D2 to the river, rather than

seepage from the lagoons. Also, during the first sampling and analyses (December 9-11, 1981) performed to the monitoring wells, the following was observed:

- a. The aluminum concentrations in the samples was higher than normally expected as a natural concentration.
- b. The cyanide concentrations in samples from wells U1 and D1 exceeded drinking water standards.
- c. The sulfate concentrations in water from well D3 was significantly higher than samples analyzed from the other wells.
- d. The phenol concentrations in samples from well U1 and D3 exceeded drinking water standards.

Ref. Nos. 5, 8, 26, 31-34

2. Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.

The aquifer of concern consisted of Quaternary alluvium overlying Tertiary and Cretaceous rocks in parts of the region and was deposited as river borne sediment. The alluvium is composed of clays, silts, sands, gravel and cobbles. These sediments are derived from igneous rocks and originated in the headwaters of the river. The subsurface beneath the site consists of a brown alluvial silty clay zone that was encountered from ground surface down to a depth of approxi-

mately 8 to 10 feet below ground surface. A fine to coarse sand and gravel zone with cobbles and boulders was identified from the 10-foot depth to approximately 22 to 28 feet below ground surface. This gravel zone typically continues until bedrock is encountered and the thickness of this zone is variable across the site. At the 28-foot depth, bedrock consists of a dark gray very fine grained and crystaline rock (igneous rock) was encountered.

Groundwater in this area exists under water-table conditions within the alluvial deposits and migration beneath the site predominantly occurs within the gravel and sand zone. water-table aguifer responded similar to a semi-confined system with a leaky confining layer during pumping. pervious overlying silty clay zone above the gravel zone responded as a recharging semi-confining layer. The leakage coefficient for the overlying layer of silty clays ranges from  $3 \times 10^{-3}$  to  $4 \times 10^{-2}$  day -and the vertical hydraulic conductivity for the overlying silty clay layer ranges from 6 x 10-6 to 9 x 10 -cm/sec. Also, the effective porosity for the silty clay layer overlying the aquifer is estimated at 5%. On the other hand, the hydraulic conductivity for the gravel zone underlying the site is  $2 \times 10^{-3}$  cm/sec, and the storage coefficient for it zone ranges from 6 x 10-4 up to 2 x 10 -3 The pores between the gravel were largely filled with fine to coarse sand with a trace of silt. The specific yield for the gravel zone is estimated at 30%. In addition, the hydraulic gradient for the site ranged from 8 x 10<sup>-3</sup>to 1.6 x 10 <sup>-2</sup>feet/ foot.

Groundwater was found at approximately 12 feet below local ground surface and flow generally toward the east. groundwater flow velocity for the gravel zone underlying the site ranges from 0.15 to 0.3 feet/day. Groundwater within the alluvial sediments at the site is recharged by precipitation and in some areas by surface waters. The Mameyes river performed as a recharge zone and the groundwater eventually discharges into the river or its tributary to the north-east. Groundwater withdrawal from the alluvial aquifer is apparently minimal. The Puerto Rico Aqueduct and Sewer Authority (PRASA) attempted to install a well about a mile south of the site, however, the well was abandoned due to difficult drilling An attempt was also made to develop a water conditions. supply from the alluvium several miles north of the site, however, the project was abandoned because of salt water instrusion. In addition, a production well at the GEPPD plant was installed within the bedrock to a depth of 155 feet, but was never used because of high iron content.

Ref. Nos. 26, 32, 33, 35-38

3. Is a designated sole source aquifer wihin 3 miles of the site?

The water-table aquifer within 3 miles of the site is not a designated sole source aquifer, nevertheless it is used as a private drinking water supply by a limited portion of the Río Grande population.

Ref. Nos. 37, 39-41, 43, 44

4. What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aguifer of concern?

The depth from the lowest point of waste storage and disposal areas to the highest seasonal level of the saturated zone of the water-table aquifer of concern fluctuates from 10 to 16 feet below ground level.

Ref. Nos. 26, 32, 33, 41

5. What is the permeability value of the least permeable intervening stratum between the ground surface and the aquifer of concern?

The Quaternary Alluvial deposits of sand and gravel underlying the clayey silt stratum in flood plains along streams are permeable ( $>10^{-3}$ cm/sec).

Ref. Nos. 26, 35, 36, 38, 45

6. What is the net precipitation for the area?

The precipitation for the area is 106.02 inches, with 13.59 inches of departure.

Ref. No. 46

7. Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).

The water-table aquifer within 3 miles of the site is used as a private drinking source by some residents of this area.

Ref. Nos. 40, 42-44

8. What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?

The information of the distance and depth of the nearest well to the site is not available at this moment, but this well is used by the Forest Service at the Luquillo National Forest for private drinking purposes and is located in the Palmer town immediacies.

Ref. Nos. 42, 43

9. Identify the population served by the aquifer of concern within a 3 mile radius of the site.

The information of the population served by the aquifer of concern within a 3-mile radius of the site is not available at present, but the population served by the above mentioned well (See Item 8) is approximately 300. On the other hand, the groundwater quality and the low yield of the water-table aquifer in the area limit the potential of the aquifer for groundwater development.

Ref. Nos. 37, 41-44

#### SURFACE WATER ROUTE

10. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility. At present, the likelihood of a release of contaminants to the surface water is minimum, because adequate management practices are observed to avoid any type of release in the hazardous wastes and raw material storage areas.

Ref. Nos. 4, 14, 22, 26

11. Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.

The nearest downslope surface water is the Mameyes river, 500 ft. east of the site, which has a drainage basin area of 17.2 square miles that extends southward into the Luquillo National Forest. The surface drainage pattern from the site is eastward to the river. In addition, north to the site is located the Honduras creek at 190 ft of distance and is tributary of Mameyes river.

Ref. Nos. 1, 3, 26, 33

12. What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected).

No contamination was detected on site; the facility slope is 2%.

Ref. Nos. 1, 35

13. What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water).

There is no intervening terrain since the site is near to the Mameyes river and the slope between them is 2%. Also, close to the site, is located the Honduras creek which slope between it and the site is 0% and no intervening terrain is present.

Ref. Nos. 1, 35

14. What is the 1-year 24-hour rainfall?

The 1-year 24-hour rainfall for the area is 6.17 inches.

Ref. No. 47

15. What is the distance to the nearest downslope surface water?

Measure the distance along a course that runoff can be expected to follow.

The distance to the nearest downslope surface water is 500 feet in an east direction from the site.

Ref. No. 1

16. Identify uses of surface water within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used). The uses of surface waters within 3 miles downstream of the site is for recreation, agricultural and industrial purposes. Nevertheless, within 3 miles upstream of the site are located the Zarzal dam (PRASA facility), some springs and creeks used as drinking water source. The Zarzal dam supplied the Mameyes, Zarzal and Mabí wards while the springs and creeks supplied the small communities located in the area.

Ref. Nos. 35, 39, 40, 44, 48

17. Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.

The Ensenada Comezón is a combination of fresh water swamp, Pterocarpus forest and mangrove that make up a large complex at the base of Punta Miquillo, 1 mile north from the site. The area lies within the Espíritu Santo Natural Reserve and is over 5,000 acres in size. This system supported the threatened White-crowned Pigeon, and the endangered West Indian Tree Duck, also, the nearly extinct Puerto Rican Parrot (protected - federal ESA) has been reported at the locality. It also serves as a refuge for numbers of herons, waterfowl and shorebirds. Until recently this site was among Puerto Rico's finest natural areas. However, in the last few years developments have destroyed several portions of the system sharply reducing the mangrove habitat. Nevertheless, Ensenada Comezón still remains a large swamp ecosystem with its fresh water portion intact. Due to its inaccessability it should primarily serve as wildlife conservation area where hunting is permitted in season.

Ref. Nos. 49, 50

18. Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.

There are no critical habitats of federally listed endangered species within 2 miles of the site along the migration path. On the other hand, at 1.8 miles south of the site is located the Luquillo Mountains which is the only refuge in all Puerto Rico for the Puerto Rican Parrot, listed under the Federal Endangered Species Act. This bird is one of the most endangered species in the entire world and no more than about 20 parrots are presently known to survive in the wild and all are found within, or at times on the outskirts of the Luquillo Experimental Forest.

In addition to supporting the Puerto Rican Parrot, the Luquillo Mountains harbor a number of other rare or endangered animals including the Puerto Rican Broad-winged Hawk, Puerto Rico Sharp-shinned Hawk, Elfin Woods Warbler, Puerto Rican Boa (Epicrates inornatus) which is listed in the Federal Endangered Species Act, Puerto Rican Snake-lizard (Diploglossus pleii), the treefrog Eleutherodactylus unicolor and the lizard Anolis occultus.

The Luquillo Mountains are one of Puerto Rico's most critical fauna regions.

Ref. No. 49

19. What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?

The nearest sensitive environment is Ensenada Comezón which is 1 mile north from the site.

Ref. Nos. 49, 50

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

There are no surface water intakes within 3 miles downstream of the site.

Ref. Nos. 48, 51

21. What is the state water quality classification of the water body of concern?

The state water quality classification for Mameyes river and Honduras creek is partially support. This two water bodies received discharges from small communities, PRASA systems, industrial activities, along with agricultural runoff that affected its water quality.

Ref. No. 48

22. Describe any apparent biota contamination that is attributable to the site.

None apparent biota contamination attributable to the site was reported or observed.

Ref. Nos. 22, 49, 50

### AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

The GEPPD facility have six cyclone dust collectors in their tool room grinder and a ventilation system for each one of the five wave solder unit available in the facility, which are the emissions control equipment that no necessarily are air pollution control equipment, but reduce the air contaminants impact to the environment. Also, the plant have ten exhausts that are an indirect help to minimize the pollution in the work areas, but these equipment are not considered a direct control measure for this purpose. All the emissions of this industry are considered normal by the standards that regulated them, therefore the possibility of a release of contaminants to the air is minimum.

Ref. No. 52

24. What is the population within a 4-mile radius of the site?

The population within a 4-mile radius of the site is approximately 23,971.

Ref. No. 53

#### FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

Some raw materials used in the pieces cleaning process and the this waste generated bv practices are flammable. Nevertheless, all the work areas and the storage areas are provided with fire extinguishers, internal and external hoses, emergency lighting with battery power, an emergency responses group, internal plant fire alarm, master fire alarm, sprinkler system, telephone system, and first aid system. All related personnel had recieved training for emergency response and the areas are adequately labeled. Also, the storage and work areas observed a proper hazardous waste management, therefore the potential for a possible fire or explosion to occur is minimum.

Ref. Nos. 14-16, 21

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the facility is approximately 9,189.

Ref. No. 53

# DIRECT CONTACT/ON-SITE EXPOSURE

27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.

The hazardous substances (flammable solvents) are located in a drum storage area that is protected by a iron gate secure with a lock and the raw materials (oils and solvents) are located in a big metal rack protected by an open aluminum warehouse. Both storage areas and the facility have an adequate vigilance with 24-hour guard service and is surrounded by a fence of approximately eight feet high. Only authorized personnel and company employees are permited in the facility area.

Ref. Nos. 14-16, 21, 22

28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?

No residents live on properties near to the site, nevertheless the nearest urban area is located at 850 feet north from the site.

Ref. No. 1

29. What is the population within a 1-mile radius of the site?

The population within a 1-mile radius of the site is approximately 2,188.

Ref. No. 53

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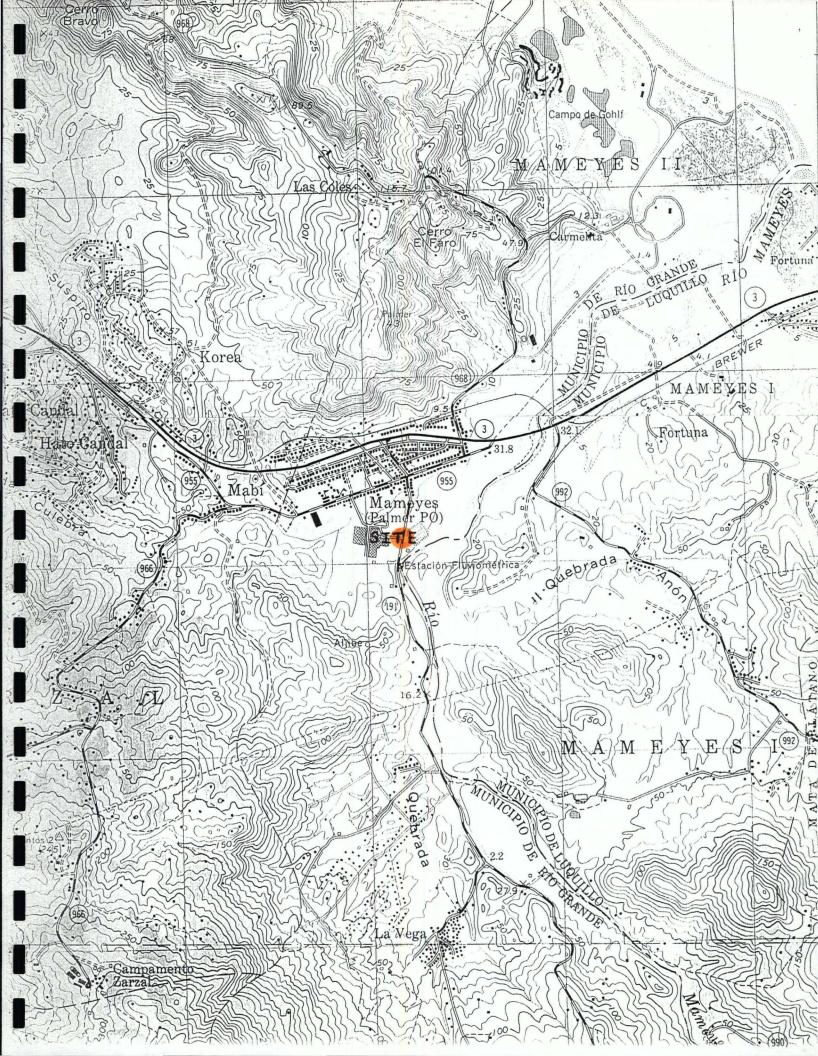
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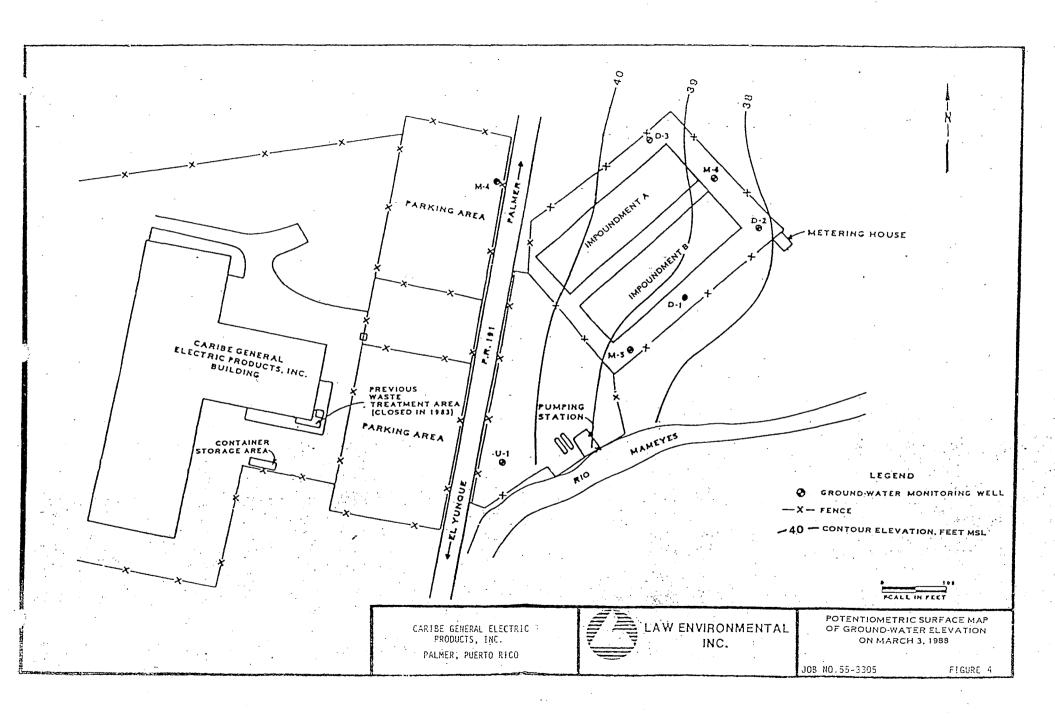
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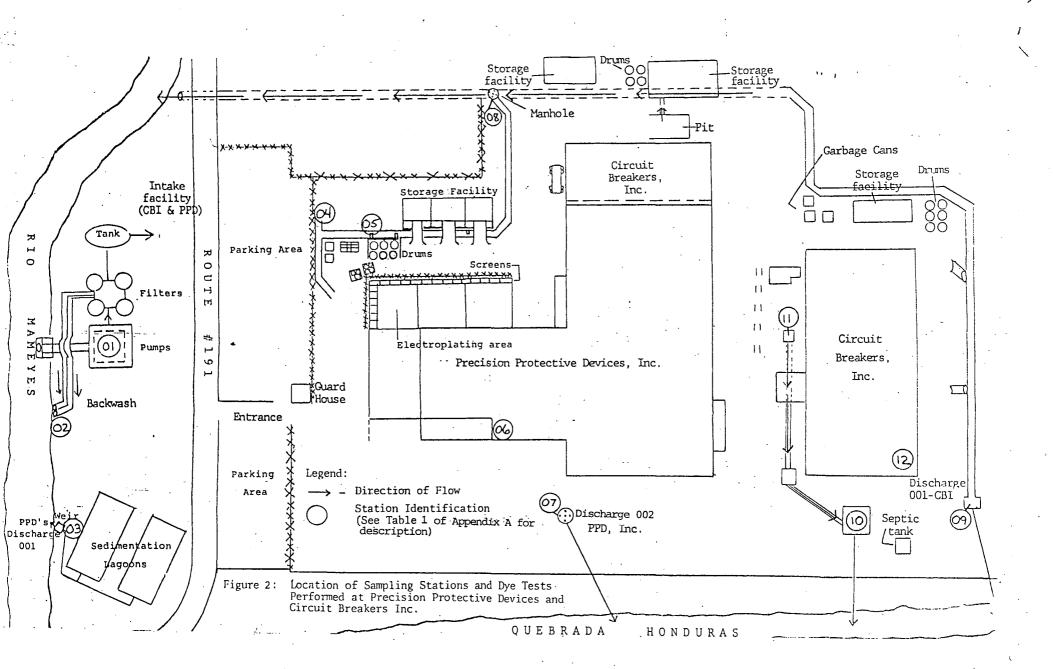
...References from 12 to 54 are included in PA-General Electric Precision Protective Devices, Inc., Río Grande, Puerto Rico - Volume II.

REFERENCE 1



REFERENCE 2





REFERENCE 3

COMMONWEALTH OF PUERTO RICO OFFICE OF THE GOVERNOR ENVIRONMENTAL QUALITY BOARD

COMPLIANCE SAMPLING REPORT ON CARIBE GENERAL ELECTRIC PRODUCTS, INC. RIO GRANDE, PUERTO RICO NPDES PERMIT PR-0000671

WATER QUALITY AREA 1988

### Background, Summary and Conclusions

Caribe General Electric Products, Inc., (CGE) located at State Road #191, km 0.5, of Palmer Ward, in Rio Grande, is engaged in the manufacturing of residential and industrial circuit breakers. The manufacturing process consists of stamping metallic parts, welding, plastic molding and assembly. The Standard Industrial Classification (SIC) code for this operation is 3613.

This facility has six (6) discharges. A maximum of 0.152 MGD is charged through Outfall 001. The wastewater in outfall 001 is comprised on non-contact cooling water from the molding and welding operations. Outfall 002 discharges a maximum of 0.22 MGD of non-contact cooling water from molding, welding and air compressors. A maximum of 0.1125 MGD of filter backwash from the water treatment system is discharged from Outfall 003. Outfalls 004, 005 and 006 discharge stormwater and runoff. Figure 1 in Appendix shows a schematic of water flow.

Outfalls 001, 002 and 005 discharge into the Quebrada Honduras and Outfalls 003, 004 and 006 discharge into the Río Mameyes. Quebrada Honduras is tributary of Río Mameyes. This facility was originally regulated under two (2) NPDES permit: No. PR0023701 (General Electric Circuit Breakers, Inc.) and PR0000671 (General Electric Precision Protective Devices). As of September 1984, the two (2) facilities merged into one and the assigned NPDES number for this newly formed facility was PR0000671.

During November 20-21, 1985 EQB personnel carried out a sampling inspection to Caribe General Electric Products, Inc. The industry was still regulated by the NPDES permits issued for General Electric Circuit Breakers and General Electric Precision Protective Devices, Inc. For this reason the sampling carried out by EQB was performed individually to each one of the facilities, since the discharges remained basically the same. In

the compliance sampling reports for the 24-hour inspections of General Electric Circuit Breakers, Inc. (GECB) and General Electric Precision Protective Devices, Inc. (GEPPD) carried out during November 20-21, 1985, a detailed discussion of the permittee's NPDES file is included. Information is presented in those reports on DMR's submitted up to November 1985 for GEPPD and up to February 1985 for GECB, and on EQB plant site compliance evaluation inspections performed up to November 1985. For this reason the discussion in this report is limited to events that occurred after those mentioned in the previous reports, except where it is necessary to refer to earlier events.

On February 7, 1985 CGE acknowledged EPA that the flow measuring equipment required by Order EPA-CWA-II-85-04, was received on February 1, 1985. The Order, issued on November 8, 1984, required to CGE to install and put into functioning said measuring equipment not later than November 30, 1984. CGE informed that the two (2) measuring units would be installed and operational by February 8, 1985.

On June 17, 1985 EQB issued a draft Water Quality Certificate (WQC) to CGE. Public notices on the intent to issue a WQC were published in local newspapers on September 30, 1985. On November 22, 1985 EQB issued the final WQC. On February 7, 1986 EPA issued a draft NPDES permit. No comments were received in EPA's offices concerning the permit. On March 21, 1986 EPA issued the final NPDES permit. It was effective on May 1, 1986 and will expire five (5) years after.

On November 10, 1986 GEPPD and GECB were referred to the EQB's Legal Affairs Division for the violations found during the sampling inspection of November 20-21, 1985. At the time of the present report no legal action has been taken.

Review of DMR's submitted to EQB by Caribe General Electric Products, Inc., from May 1986 through March 1988, indicated violations of NPDES permit effluent limitations for boron (B), sulfide (S), total

suspended solids (TSS), biochemical oxygen demand (BOD<sub>5</sub>), oil and grease, color, iron (Fe), surfactants, silver (Ag), copper (Cu) zinc (Zn), turbidity, and chemical oxygen demand (COD). The review of DMR's also revealed the not reporting of some parameters and incorrect frequency or type of analysis. In the major part of the DMR's no data was submitted for the stormwater discharges (004, 005, 006), and the backwash discharge (003). The flow rate was reported as an estimate and not as a measured value, as required by the permit. These violations are summarized in Table 1.

A plant site evaluation inspection was carried out to Caribe General Electric Products, Inc. by EQB personnel on May 24, 1988. The followings were the findings of this inspection:

- a. Accurate records of raw water volume were not maintained.
- b. Permittee flow measurement do not meet the requirement and intent of the permit. Secondary instruments for Outfalls 001 and 002 were out of service during the inspection. The primary flow measuring device for Outfall 001, which consists of a 45° V-Notch weir, is not properly operated and maintained. The bottom of the weir was totally covered with debris.
- c. Outfall 001 effluent was observed with oil sheen, grease and foam. Outfall 003's effluent was observed with turbidity and a light brown color. The surface of the water in a stormwater ditch was observed with oil sheen.

In the previous 24-hour sampling inspection carried out at Caribe General Electric Products, Inc., during November 20-21, 1985, it was found that:

1. In the facility formerly known as General Electric Circuit Breakers (GECB) NPDES permit limitations were violated for

total suspended solids (TSS) and flow at Outfall 001 (cooling waters from molding and welding). WQSR standards were violated for Zn and Fe at Outfall 002 (Stormwater Runoff); color and Fe at Outfall 003-Backwash; and DO, fecal coliforms, and total coliforms at Outfall 003-Overflow (From Septic Tank).

2. In the facility formerly known as General Electric Precision Protective Devices (GEPPD) Discharge 002 (cooling waters from molding and welding) violated WQSR standards for total coliforms and fecal coliforms. Two (2) stormwater runoff discharges violated WQSR standards for surfactants. Fe, phenolic substances, Pb, Cd, Zn, Cu and Ag in both of them; and Total Cr in one of them. Said stormwater discharges were detected with high concentrations of oil and grease. They were observed with a lot of oil and grease, solids, turbidity and a light brown color. The filter backwash discharge was observed with turbidity, foam and a brown color, in addition to the violations to the WQSR for color and Fe, mentioned for GECB, since it was the same backwash for both industries.

In the present 24-hour sampling inspection at Caribe General Electric Products, Inc. (CGEP), during May 24-25, 1988 it was found that the permittee violated NPDES permit limitations for: S, Ag, phenolic substances, Cd, and fecal coliforms at Station 001 (cooling waters from molding and welding); surfactants, S, Fe, Ag, phenolic substances, and fecal coliforms at Station 002 (cooling waters from molding, welding and condensers); Zn, total suspended solids (TSS), Fe, fecal coliforms and total coliforms at Station 003 (Filter Backwash); and pH, dissolved oxygen (DO), settleable solids (SS), phenolic substances, Zn, color, surfactants, S and Fe at Station 005 (Stormwater Runoff Outfall). The flow through this last Station was attributed to a septic tank overflow which gained access to a stormwater grating which discharge to Station 005. Before reaching the stormwater grating, a sample was taken at the exit of this discharge through a pipe. This point identified as Station 008 violated

WQSR standards for fecal coliforms and total coliforms. Another discharge from the same septic tank was detected at Quebrada Honduras (Station 007). This discharge also violated WQSR standards for fecal coliforms and total coliforms.

Table 1: Violation of NPDES Permit Limitation as Reported by Caribe General Electric Products Inc. on DMR's for the Monitoring Period of May 1986 through March 1988.

Monitoring		ıtfall Parameter/	Renort	Reported Compliance					
Period		No. Permit Lim		Valu		Factor			
101104		TO TO THE MAIN.	itation	, 414		1 40101			
May 1986	001	Dissolved Oxygen			<del> </del>				
•		(DO), residual							
		chlorine, pH,							
		cadmium (Cd)		N/R					
*		Oil and Grease	Ir	icorrect f	requency	of analysis.			
		Boron (B)							
		1,000  ug/l Max.	1	,900		1.9			
		(1.10° 1 (61)							
		Sulfide (S)	0	0.00		1 000			
		2 ug/l Max.	2	,000		1,000			
	002	DO, residual chlorin	ne.						
		pH, Cd		N/R					
	000	m	m 41. 4	1 17.1					
	003	flow	Estimat	ed Value	•				
		DO, residual							
		chlorine, pH	]	N/R	-	•			
		-							
		S	n	000	1 00	10			
		2 ug/l Max.	4	,000	1,00				
	004								
	005	No data submitted	•						
	006				•				
<del></del>				· · · · · · · · · · · · · · · ·					
June 1986	001	DO, residual				***			
		chlorine, pH		N/R	_				
		Temperature	Incorrec	t frequen	cy of mo	nitoring.			
	002								
	003								
	004	•				٠			
	005					,			
	006	No data submitted	•						
T1112 1006	001	Total augnended		··					
July 1986	001	Total suspended solids (TSS)	Incorre	et type c	of samples	S.			
		001100 (100)	111.75.2.2.0			<del>-</del> -			
		DO, residual chlori	ne	N/R	-				

pH, temperature Incorrect frequency of monitoring.

Monitoring Period	Outfal No.	l Parameter/NPDE Permit Limitation	_	Compliance Factor
	002	TSS	**************************************	·
	ŲU <i>Z</i>	20,000 ug/l Max.	107,000	5.35
		DO, residual	•	
		chlorine, COD	N/R	
		Oil and Grease		
		15,000 ug/l Max.	22,000	1.47
		pH, temperature	Incorrect frequency	of monitoring.
	003	·		
	004			
	005 006	No data submitted.		
Anguet 100		TSS	Incompact tons of a	omplo
August 198	6001	DO, residual	Incorrect type of s	ampie.
		chlorine, temperatur	e N/R	-
		рН	Incorrect frequency	of monitoring.
	002	flow	Estimated Value.	
	I	residual chlorine, DO, COD, temperatu	re N/R	<del>-</del>
		рН	Incorrect frequency	of monitoring.
·	003	No flow was reported	i.	
	004			
	005 006	No data submitted.		×
Sept.1986	001	Color		
		10.0 PT/Co Max.	23	2.3
	003	Color		
		10.0 PT/Co Max.	65	6.5
	004			
	005	No data submitted.		
	006	•		
Oct. 1986	001	Flow		
		Residual Chlorine,		

Table 1:	Vio		Permit	Limitation	as Continued							
Monitoring Period	Outf No.			eported Value	Compliance Factor							
4	002	Flow	Estimate	ed Value.								
		DO	Incorrec	t frequency	y of monitoring.							
		Residual Chlorin pH		I/R								
		Temperature	Freque	ency of anal	lysis not reported.							
	003 No flow was reported.											
	004 005 006	No data submitted	d.									
Nov. 1986	001	Flow	Estimate	ed Value.								
		DO	Incorrec	et frequency	y of monitoring.							
		Residual Chlorine,	pH N	1/R								
		Color 10.0 Pt/Co Max.		50	5							
	002	DO	Incorre	ect frequen	cy of monitoring.							
		Residual Chlorine,	pH N	J/R	-							
		Color 10.0 Pt/Co Max.		24	2.4							
	003	No discharge was n	reported.									
	004 005 006	No data submitte	d.		, <u>V</u> ,							
Dec. 1986	001	Flow	Estimate	ed Value.								
		DO, residual chlori pH, temperature		1/R	-							
	002	Flow	Estimat	ed Value.								
·		DO, total coliform residual chlorine pH, temperature	,	N/R	· <del>-</del>							

Table 1:	Vio	lation	of	NPDES	Permi	t Lin	nitation	as	Continu	ed
Monitoring Period	Outfa No.	all		neter/NPI nit Limita			orted alue	C	ompliance Factor	9
	003		F	low	Estin	nated	Value.			
				ual chlori nperature		N/R	•		-	
	004 005 006	Sam	ples	not taker	ı.					·
Jan. 1987	001		F	low	Estin	nated	Value.	<del></del>		
				ual chlori nperature		N/R			· -	•
		3		Fe g/l Max.		470			1.57	·
	002		F	low	Esti	mated	Value			
	D			l chlorine erature	е, рН	N/R			<del>-</del>	
	003		F	'low	Esti	mated	Value			
			lual c	O, chlorine, erature	pН	N/R	•		-	
	004 005 006	Sam	ples	not take	n.					
Feb. 1987	003		F	low	Esti	mated	Value	. \		
	004 005 006	Sam	ples	not take:	n.			, -		
March 1987	001	1		actants g/l Max.	<del>*</del>	200	· · · · · · · · · · · · · · · · · · ·	<del></del>	2	•
	002		В	OD, ag/l Max.	,	37,00	0		7.4 .	
	003		F	Flow	Esti	mated	Value			

Monitoring Period	Outfal No.	Parameter/NPDES Permit Limitation	Reported Value	Compliance Factor
	004 F	low, DO, Temperature fluoride (F), sulfide (S)	N/R	
		Color 10.0 Pt/Co Max.	50	<b>5</b>
		Surfactants 100 ug/l Max.	300	3
		Fe 300 ug/l Max.	510	1.7
		Ag 2 ug/l Max.	4	2
	005	Flow	N/R	-
		TSS 50,000 ug/l Max.	112,000	2.24
	D	O, Temperature, F, S	N/R	-
		Color 10.0 Pt/Co Max.	20	2
		Oil and Grease In	correct frequen	cy of monitoring.
		Cu 40 ug/l Max.	80	2
		Surfactants 100 ug/l Max.	180	1.8
		Fe 300 ug/l Max.	710	2.37
		Ag 2 ug/l Max.	4	2
		Zn 50 ug/l Max.	210	4.2
	006	Flow, DO, Temperature, F, S	N/R	· -
		TSS 50,000 ug/l Max.	136,000	2.72
				i i

Table 1:	Viol	ation of NPDES P	ermit Limitation	as Continued
Monitoring Period	Outfa No.	ll Parameter/NPDE Permit Limitatio	•	Compliance Factor
		Color 10.0 Pt/Co Max.	100	10
		Turbidity 50 NTU Max.	93	1.86
		Chemical Oxygen demand (COD) 100,000 ug/l Max.	400,000	4
		_	Incorrect frequen	
		Fe 300 ug/l Max.	1,070	3.57
· .		Ag 2 ug/l Max.	4	2
April 1987	001	Color 10.0 Pt/Co Max.	30	3
		COD 50,000 ug/l Max.	75,000	1.5
	002	Surfactants 100 ug/l Max.	330	3.3
		Zn 50 ug/l Max.	140	2.8
	004 005 006	No discharge was re	ported.	·
May 1987	001	Color 10.0 Pt/Co Max.	25	2.5
		Fecal Coliform	N/R	<del>-</del>
	002	Total Coliforms, Fecal Coliforms	N/R	
	003	Fecal Coliforms	N/R	<del>-</del> · .
	004	Flow, BOD <sub>5</sub> , TSS, DO COD, F, S	N/R	

Monitoring Period	Outfall No.	Parameter/NPDE Permit Limitatio		Compliance Factor
		Color 10.0 Pt/Co Max.	25	2.5
		Surfactants 100 ug/l Max.	800	8
		Fe 300 ug/l Max.	2,980	9.93
		Ag 2 ug/l Max.	4 ,	2
	005	Flow, BOD, TSS, DO, COD, F, S	N/R	-
<b>'</b> -		Color 10.0 Pt/ Co Max.	15	1.5
		Surfactants 100 ug/l Max.	290	2.9
		Fe 300 ug/l Max.	680	2.27
		Ag 2 ug/l Max.	4	2
	006	Flow, BOD <sub>5</sub> , TSS, DO, COD, F, S	N/R	-
		Color 10.0 Pt/Co Max.	25	2.5
		Surfactants 100 ug/l Max.	800	8
		Fe 300 ug/l Max.	2,980	9.93
		Ag 2 ug/l Max.	4	2
June 1987	003	Flow	Estimated Value.	•
	004 005 006	No discharge	was reported.	·

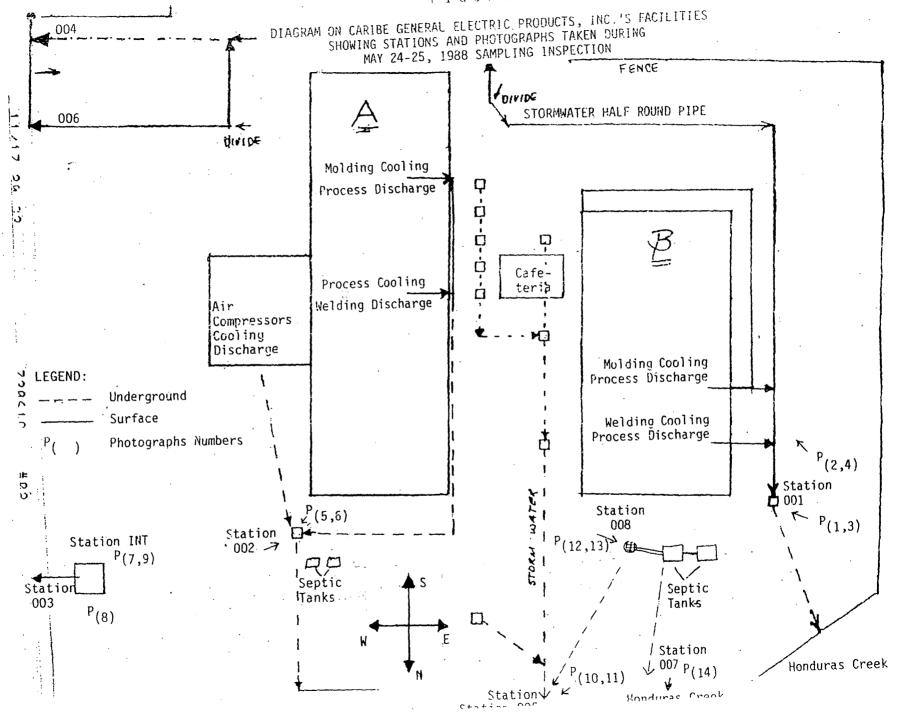
Table 1:	Violat	ion of NPDES I	Permit Limitation	as Continued
Monitoring Period	Outfall No.	Parameter/NPDE Permit Limitation	-	Compliance Factor
July 1987	004 005 006	No discharge wa	s reported.	
Aug. 1987	001	Fecal Coliforms	N/R	Time to the state of the state
	002	Fecal Coliforms, Total Coliforms	N/R	-
		S 2 ug/l Max.	790	395
·	003	No discharge at tir	ne of sampling.	
	004 005 006	No discharge was	s reported.	
Sept. 1987	001	Cu 40 ug/l Max.	100	2.5
		S 2 ug/l Max.	599	299.5
		Zn 50 ug/l Max.	80	1.6
	002	S 2 ug/l Max.	699	349.5
·	003	Color 10.0 Pt/Co Max.	15	1.5
		S 2 ug/l Max.	799	399.5
	004 005 006	No discharge was r	eported.	
Oct. 1987	001	BOD <sub>5</sub> 5,000 ug/l Max.	7,000	1.4
		TSS 20,000 ug/l Max.	58,000	2.9
	002	TSS 20,000 ug/l Max.	193,000	9.65

Table 1:	Violat	tion of NPDES Pe	ermit Limi	tation as Continued
Monitoring Period	Outfall No.	Parameter/NPDES Permit Limitation		
		Fe 300 ug/l Max.	800	2.67
		_	000	2.01
		Zn 50 ug/l Max.	120	2.4
	003 004 005			·
	006	No Data reported.		
Nov. 1987	001	S 2 ug/l Max.	1,199	599.5
,	003 004 005			
	006	No data submitted.		
Dec. 1987	001	TSS 20,000 ug/l Max.	41,000	2.05
		Color 10.0 Pt/Co Max.	50	5
		Fe 300 ug/l Max.	2,130	7.1
	002	DO	Incorrect	frequency of monitoring.
	003 004	·		
	005 006	No data submitted.		
Jan. 1988		Residual Chlorine, COD, Cl, Oil & Grease l, Cr, Cu, surfactan Pb, Ag, S		
·		Residual Chlorine, or, COD, Cl, Total F Oil & Grease, B, Cd,		
·		Cr, Cu, F, Ag, S	N/R	

Monitoring Period	Outfa No.		Reported Value	Compliance Factor
	003	Flow, BOD, Total P, Oil & Grease, B, Cu,		
		Cr, F, Pb, S, Ag	N/R	<del></del> ,
		Color 10.0 Pt/Co Max.	85	8.5
		Fe 300. ug/l Max.	1,480	4.9
	004 005			
•	006	No data submitted		
Feb. 1988	003	TSS 40,000 ug/l Max.	125,000	3.12
		Fe 300.0 ug/l Max.	790	2.63
	004 005 006	No data submitted.		
March 1988	003	Fe 300 ug/l Max.	420	1.4
	004 005		٠	
		No data submitted.	•	

# LEGEND:

Max= Daily Maximum N/R= Not Reported



COMMONWEALTH OF PUERTO RICO OFFICE OF THE GOVERNOR ENVIRONMENTAL QUALITY BOARD

COMPLIANCE SAMPLING REPORT ON
GENERAL ELECTRIC PRECISION PROTECTIVE DEVICES, INC.
RIO GRANDE, PUERTO RICO
NPDES PERMIT PR-0000671

WATER QUALITY AREA 1986



#### BACKGROUND, SUMMARY AND CONCLUSIONS

General Electric Precision Protective Devices, Inc. (GEPPD), located at State Road No. 191, Km. 0.5, in Palmer, Río Grande, is engaged in the manufacturing of residential and industrial circuit breakers. The manufacturing process consists of stamping metallic parts, welding, plastic molding and assembly. The Standard Industrial Classification (SIC) code for this operation is 3613. The facility is adjacent to Circuit Breakers, Inc. (CBI), both subsidiaries of General Electric Company, which is engaged in the manufacture of electric devices.

Sources of water consist of municipal water supply and intake waters from Río Mameyes. The later is used by both facilities for their industrial processes.

Wastewaters in GEPPD result from molding, welding and air compressor cooling waters, which are discharged to Quebrada Honduras, a tributary of Río Mameyes. Backwash water from sand filter is discharged to Río Mameyes. The receiving water bodies are classified as SD use classification under the Puerto Rico's Water Quality Standards Regulation (WQSR). Sanitary wastewaters are disposed through septic tanks in the facility's lot.

At the sampling moment the facility is regulated by a second round NPDES permit no. PR-0000671, effective on October 31, 1980 and which expired on June 30, 1985. As of September 1984 GEPPD and CBI were merged into one, named now Caribe General Electric Products Inc., and a NPDES permit modification was requested EPA on October 29, 1984. Since the new permit had not been issued by EPA and discharges remained basically the same, results of the sampling inspection were compared with the second round permit still in effect.

On June 22, 1984 EPA notified GEPPD on excursion reported on February 1983 DMR's for color at Outfall 002. On July 20, 1984 GEPPD's contracted laboratory explained EPA the cause of this type of non-compliance in cooling water was either oil contamination where compressors were used or runoff water from heavy rain or combination of both. The laboratory recommended GEPPD to provide adequate supervision to prevent contamination of the cooling wastewater.

On July 30, 1984 EPA issued an "Order" (EPA-CWA-II-84-36) for findings resulting from an April 30, 1984 inspection, conducted by EPA and EQB. During this inspection it was found that the flow, temperature and pH recorders were out of service for more than one year. Values for pH, flow and temperature reported in DMR's were estimated. Moreover, it was found that during rainy weather, stormwater runoff from the storage area and the settling pond containing electroplating sludges would be discharged into the receiving body of water. The inspectors also found that the backwash wastewater from sand filters would be discharged during backwash operations (it had been found also in November 29-30, 1983 EQB's sampling inspection). Said wastewaters were not authorized discharges. The following was required by the "Order."

a. Within 30 days of the receipt of the Order, the permittee must demonstrate that all measuring devices were operated and

would probably be shipped by the next week. On February 7, 1985 GEPPD acknowledged EPA that the measuring equipment was received on February 1, 1985 and would be installed and operational by February 8, 1985.

An NPDES permit modification application was submitted on October 29, 1984 by Caribe General Electric Products Inc., which had acquired all assets and liabilities of Protective Devices, Inc. and Circuit Breakers, Inc. The new corporation would assume all environmental responsibilities of former operations which remain in the same site. The permit application was submitted for the two (2) facilities in conjunction. On June 17, 1985 EQB issued a draft WQC. Public notices on the WQC were published in local newspapers on September 30, 1985. EQB issued the final WQC on November 22, 1985. At the moment of the sampling EPA had not issued the NPDES permit modification.

Review of DMR's submitted to EQB by Precision Protective Devices from October 1983 through November 1985, indicated violations of NPDES permit effluent limitation for color. Reported values for temperatures, pH and flow were based on estimates during monitoring periods of October 1983 to November 1984 and February 1985 to June 1985. Monitoring reports for two (2) periods were not found in EQB files. These violations are present in Table 1. In addition, no evidence was found in EQB files on the submittal of results of the monitoring of stormwater runoffs from the storage area and settling pond, and from filter backwash as was required by EPA's Order of July 30, 1984.

Besides the plant site inspection carried out by EQB and EPA on April 30, 1984, already mentioned, two (2) other have been performed to GEPPD. On that carried out on March 20, 1985 by EPA and EQB, the plant was found functioning in satisfactory conditions. In plant site inspection carried out on November 20, 1985 by EQB concurrently with the sampling inspection, it was found that:

- a. Not all discharges were authorized. The filter backwash was not included in the permit.
- b. Concerning the self monitoring program, the permittee flow measurement did not met the requirements and intent of the permit.
- c. The primary and secondary flow measuring devices were not properly operated and maintained.
- d. The flow measurement equipment was not adequate to handle expected ranges of flow rates.
- e. The pH meter was out of service.
- f. Parameters and sampling frequency did not agreed with the permit.
- g. Two (2) stormwater discharges were observed with a lot of solids, oil and grease, and solids, and with turbidity and a light black color.
- h. The filter backwash was observed with turbidity, foam and a

brown color.

In the previous 24-hour sampling inspection carried out at Precision Protective Devices, Inc., during November 29-30, 1983 it was found that the permittee had violated WQSR standards for fecal coliforms, zinc and silver at the authorized discharge 002. In addition, said discharge violated the NPDES clause which stated that "there shall be no discharge of floating solids or visible foam." Four (4) illegal discharges were also sampled. One consisted of the filter backwash, other an overflow the settling lagoons, one was a stormwater discharge and the last one a flow of water from a retention dike in a drum storage area. The backwash exceeded the WQSR standards for zinc, color, and total chromium. The previously authorized Discharge 001 had been eliminated but the lagoons, from which Discharge 001 occurred, with accumulated sludge still existed and overflow occurred during rainy periods. Samples of a sedimentation lagoon showed violations to the WQSR for silver, copper and zinc. Results of samples taken from a stormwater concrete ditch showed violations to the WQSR for oil and grease, dissolved oxygen, lead, cadmium, zinc, copper, total chromium and silver. Finally, results of samples taken from flow of a drum storage area showed violations to the WQSR for oil and grease, copper, zinc, silver and total chromium. EPA assumed jurisdiction over this case and performed an inspection to GEPPD facilities on April 30, 1984. On July 30, 1984 EPA issued the aforementioned "Order." Subsequent steps aforementioned were taken by the company to remediate the situation.

In the present inspection, carried out on November 20-21, 1985, it was found that the permittee complied with all the NPDES permit limitations at the authorized discharge 002. However, the parameters fecal coliforms and total coliforms were found violating the WQSR at said discharge. In addition two (2) stormwater runeff discharges sampled violated WQSR standards for surfactants, iron, total phenolic substances, lead, cadmium, zinc, copper and silver, and total chromium in one of them. Oil and grease concentrations at both stations were very high. Moreover, results of the filter backwash showed violations to the WQSR for color and iron.

TABLE 3: ANALYTICAL RESULTS OF COMPOSITE SAMPLES FROM THE EFFLUENT AND INTAKE WASTEWATERS OF GENERAL ELECTRIC PRECISION PROTECTIVE DEVICES, IN RIO GRANDE, COMPARED TO NPDES PERMIT LIMITATIONS AND WQSR FOR SD WATERS

		CONVENT	'IONAL POLI	UTANTS	: TOXIC POLLUTANTS							
i	TDS mg/l	TSS mg/l	Fe mg/1 (ug/1)	B mg/l (ug/l)	Surfactants ug/l	: Pb : ug/l	Cd ug/1	Zn ug/l	Cu ug/l	Total Cr ug/l	Ag ug/1	
NPDES Permit Limitations Outfall 002	500.0 Max.	40 Max.	2.5 Max.	1.0 Max.	N/L	: : N/L :	N/L	N/L	N/L	N/L	N/L	
Station 002	449	44.5	(921.3)	(30)	-	: 12.2	0.4	36.5	11.7	6.0	0.7	
Station INF (Intake)	58	23.5	(818.2)	(4)	273	: 16.4 :	0.1	28.9	6.4	86.4	0.0	
Net	391	21.0	(103.1)	(26)	N/A	: N/A	N/A	N/A	N/A	N/A	N/A	
WQSR FOR SD WATERS	500.0 Max.	а	(300.0) Max.	(1,000.0) Max.	100.0 Max.	: 50.0 : Max.	5.0 Max.	50.0 Max.	40.0 Max.	50.0 Max.	2.00 Max.	

#### LEGEND:

Max. = Daily Maximum

N/L = Not Limited

N/A = Not Applicable

- = Not Analyzed

TABLE 5: FIELD MEASUREMENTS OF GRAB SAMPLES AND ANALYTICAL RESULTS OF GRAB SAMPLES FROM STORMWATER DISCHARGES AND FILTER BACKWASH OF GENERAL ELECTRIC PRECISION PROTECTIVE DEVICES, IN RIO GRANDE, COMPARED TO WQSR FOR SD WATERS

	FIELD MEASUR	REMENTS	:				ANALYTICAL RESULTS								
	Temperature °C (°F)	pH SU	Dissolved Oxygen (DO) mg/l	i : : :Color :Pt/Co	Turbidity NTU	Oil & Grease mg/l	Surfactants ug/l	Fe :	Total Phenolic Substances ug/l	Pb ug/l	Cd ug/1	Zn ug/l	Cu ug/l	Total Cr ug/l	Ag Ug/1
Station 001-SW Stormwater Discharge	26.0	6.9	6.9	: -	0	26.1	12,757	12,684	83.8	302.9	28.7	1,655.4	318.8	69.0	42.3
Station 002-SW Stormwater Discharge	25.5	7.0	6.0	: -	-	4,726	1,514	3,361.8	8.7	137.5	16.4	333.0	113.9	31.7	9.7
Station 003- "Backwash"	÷	-	-	: :20	14.0		-	3,327.4	-	16.8	_	36.5	13.2	5.1	<u> </u>
WQSR for SD Waters	34.5 (94)	6.0-9.0	5.0	:10	50	a	100.0	300.0	1.00	50.0	5.0	50.0	40.0	50.0	2.00

#### LEGEND:

Max. = Daily Maximum
- = Not Analyzed

<sup>=</sup> Section 2.1.1 of Puerto Rico's WQSR states that the waters of Puerto Rico shall not contain oil attributable to discharges in amounts sufficient to be unsightly or deleterious. A maximum permitted concentration of 15.0 mg/l is recommended by EPA.

## COMMONWEALTH OF PUERTO RICO OFFICE OF THE GOVERNOR ENVIRONMENTAL QUALITY BOARD

FINAL

COMPLIANCE SAMPLING REPORT ON Precision Protective Devices, Inc. Palmer, Rio Grande, Puerto Rico NPDES PR-0000671

WATER QUALITY AREA 1984

#### BACKGROUND, SUMMARY AND CONCLUSIONS

Precision Protective Devices, Inc. (PPD) with Standard Industrial Classification (SIC) code of 3471, and a subsidiary of the General Electric Company, was originally engaged in electroplating, of metal parts used in the manufacture of electrical switches and circuit breakers but is now engaged in the molding and welding of metal parts for switches. This facility, located in route 191 of Barrio Palmer, Río Grande, is adjacent to Circuit Breakers Inc. (CBI), another subsidiary of the General Electric Company which is engaged in the manufacture of electrical devices.

Sources of water consist of municipal water supply and intake waters from Rio Mameyes. The latter is used by both facilities for their industrial processes.

On October 31, 1980, a second round NPDES permit with number PR-0000671 was issued to PPD. The permit contains effluent limitations and monitoring requirements for two discharge points: discharge 001 (03)\* and 002 (07)\*. Treated electroplating wastewaters are discharged through outfall 001 (03) to Rio Mameyes, a water body with use classification of SD by Puerto Rico's WQSR. Wastewaters from discharge 002 (07) consist of a combination of non-contact cooling waters from compressor and molding, contact cooling water from welding and storm water. These wastewaters are discharged to Ouebrada Honduras, a tributary of Rio Mameyes with use classification of SD.

Wastewaters generated by PPD's electroplating process were treated as follows: Electroplating rinse waters were segregated into chromium or acid/alkaline streams. The chrome rinse water was subjected to chrome reduction and was then mixed with the acid/alkaline rinse water. This mixture was pH adjusted for optimum metals precipitation in settling lagoons. Any concentrated clumps of chrome or acid /alkaline were transfered to separate holding tanks where they were slowly bled to their respective treatments. The treated waters from settling lagoons were then discharged through outfall 001 (03) to Río Mameyes. Combination of non-contact cooling waters, contact cooling waters and storm water did not receive treatment prior discharge. Sanitary wastes go to a septic tank.

During October 27-28, 1981 a 24-hour sampling inspection was carried out by EQB personnel to PPD's effluent. A compliance sampling report was prepared by the WQB which includes in addition to sampling results, an extensive review of PPD's

<sup>\*</sup>Footnote: Discharges 001 and 002 correspond to FQB's sampling stations 03 and 07 respectively, according to the uniform numeric code established for this report.

6. inform EQB and EPA of any by-pass that may occur in the permittee's facilities.

In addition, it was recommended that EQB take immediate enforcement action against the permittee for:

- 1. Violations to permit limitations on nickel, and tin encountered during the 24-hour sampling inspection;
- 2. violations to Water Quality Standards for dissolved oxygen, boron, zinc, copper, silver, color, TDS, surfactants and total coliforms as reported in the 24-hour sampling inspection; and
- 3. violations of nickel, zinc, tin, pH, total suspended solids, total dissolved solids, color, silver and boron as reported on DMRs submitted by PPD. Due to an omission error parameters temperature, copper cadmium, iron, aluminum and oil and grease were not included in the recommendations.

#### It was also recommended that:

- 1. Parameters COD and total phosphorus be limited for discharge 001 (03) and iron and aluminum be limited for discharge 002 (07). These parameters were found in high concentrations during the 24-hour sampling inspection.
- 2. That EQB order PPD to shutdown the relief valve of the fire pump on their facilities because it was expelling highly contaminated water which exceeded the standards of Puerto Rico's WOSR. The flow from this valve constituted an illegal discharge.

Legal action against the PPD was recommended on July 7, 1982, but no legal action had been initiated against the permittee by the time the current 24-hour sampling inspection was performed.

On May 10, 1982 PPD informed EPA the future elimination of electroplating processes and discharge 001 (03) from associated wastewater treatment system before July 1, 1983. With the elimination of said process they would eliminate the need for upgrading the existing wastewater treatment system and comply with the schedule of compliance. Meanwhile the facility would install a vibratory deburring process which would add 1 gpm to their NPDES permitted discharge 001 of 40 gpm of treated electroplating rinse waters. The new vibratory

deburring discharge to 001 (03) would only be temporary as they would discharge to the sanitary sewer as soon as this was available (early 1983, according to PRASA).

On letter dated May 24, 1982 PPD informed EQB of this new installation and requested said agency to revise technical data forwarded and determine whether a modification of their current NPDES permit was required. After evaluating the petition letter, EQB answered PPD on August 13, 1982 that there was no objection to the requested increase in the maximum flow limitation for outfall 001 (03). However, this change was not reflected in the permit.

Last report of monitoring results from discharge 001 in DMRs was during monitoring period ending January 31, 1983. In this DMR, PPD informed that an affidavit for discharge exemption for this discharge 001 (03) was sent to EPA by then and the new time table for no discharge was February 1983. Permit modifications were requested by the permittee on the same letter.

On February 14, 1983 the permittee informed EPA the elimination of the PPD electroplating operation and thus discharge 001 (03). The elimination of said discharge was confirmed by EQB during the 24-hour sampling inspection performed on November 29-30, 1983. The electroplating process was eliminated and all the equipment was sold to an electroplating company located in Dorado. The company is now engaged only in molding and welding processes. In relation to permit modifications, no permit modification has been pursued by the permittee since the February, 1983 communication.

A review of available DMRs submitted by PPD shows that the parameters color, nickel, silver, zinc, boron, copper and tin has been reported as in non-compliance with permit effluent limitations. These same parameters were found in non-compliance in the previous DMRs review performed as part of the Compliance Sampling Report of October 27-28, 1981 sampling inspection. Table 2 of Appendix A shows parameters and permit effluent limitations violated by PPD from monitoring periods May, 1981 through September, 1983.

In addition to violations to the NPDES permit limitations for said parameters, PPD has failed in sending non-compliance notifications as stated in the permit. Upon request from EPA, PPD explained on letter dated December 10, 1982 that apparent violations on effluent for their discharge number 001 (03), on nickel, zinc and tin were due to problems with sludge accumulation over the years in their sedimentation lagoons and the heavy rains in that area. EPA requested formal non-

compliance notifications in various occassions (July 30, 1982; November 19, 1982 and March 14, 1983). No response has been sent according to our records.

The Permits Division personnel has performed two (2) compliance evaluation inspections of PPD's wastewater treatment system. During the December 8, 1982 inspection it was observed that the sedimentation lagoons had a lot of sludge. Facility's representatives informed EQB personnel that they planned to dry the sludge and transport it to the United States. The facility installed a Parshall Flume and recorder for discharge 002 (07).

During the inspection performed on November 19, 1983 the following aspects of the facility evaluation were found to be unsatisfactory:

- 1. Permit verification: No notification was given to EQB and EPA of new, different or increased discharges, no accurate records of raw water volume were maintained, and the number and location of discharge points were not as described in the permit.
- 2. Self-monitoring program: The primary flow measuring device was not properly installed, operated and maintained. Totalizers and recorders were not properly operated and maintained (they were out of service). The flow measurement equipment was found not adequate to handle expected ranges of flow rates. The pH and DO meters were out of service. The company was estimating pH, temperature and DO based on previous DMRs. Calibration and maintenance of instruments and equipment were found unsatisfactory.
- 3. Effluent observations. Authorized outfall 002 (sampled at station 07) showed an appreciable quantity of visible foam during a period of 15 to 30 minutes at 0140 hours of day November 29, 1983. Unauthorized discharges at stations 02 and 04 were detected. Discharge 02, consisting of filters backwash showed turbidity and light black color. Discharge 04 was identified as a storm water sewer discharge which had some oil sheen and grease residues, turbidity and light brown color.

In addition to these two previous inspections, another inspection was performed to PPD's facilities by EQB personnel on December 2 and 5, 1983. The inspection was carried out by technicians from the Land Pollution Control Area with the purpose of perform a Full Resource Conservation Recovery Act (RCRA) inspection in accordance to the State Regulations

(Regulation for the Control of Hazardous and Non-Hazardous Solids Wastes, amended version, March 5, 1982). During this inspection it was found that the industry is not complying with the State Regulations. Applicable legal action was requested in January 23, 1984 to EOB's Legal Division for violations classified as Class I while a Notice of Deficiencies was sent to PPD for correction of Class III violations. Most of these findings were informed by the Permit and Engineering Division personnel as poor housekeeping practices that may represent a potential source of contamination to water bodies near PPD's facilities. A copy of the report prepared by the Land Pollution Control Area indicating the findings and violations observed during December 2 and 5, 1983 inspection, has been included in Appendix D. Copies of photographs taken during the inspection as well as referral to EOB's Legal Division and Notice of Deficiencies sent to PPD have also been included in Appendix B.

During the 24-hour sampling inspection performed on November 29-30, 1983 to PPD's facilities, it was found that the permittee increased the concentration of zinc (Zn) and exceeded the WOSR standard for fecal coliforms at station 07. Both contaminants were considered illegal. Four unauthorized discharges, identified as stations 02, 03, 04 and 05, were identified and sampled. Parameters found to exceed the WQSR standards were: color, Zn and copper (Cu) at station 02; Zn, Cu and silver(Ag) at station 03; oil and grease, lead (Pb), cadmium (Cd), total chromium (Cr total), Zn, Cu and Ag, at station 04; and oil and grease and Cu, Cr total, Ag, and Zn at station 05. Dissolved oxygen (DO) was found below the minimum concentration required by the WQSR standard at station 04.

Table 1: Uniform Numeric Code for Station Identification of Precision Protective Divices Inc. (PPD) and Circuit Breakers Inc. (CBI) Referred to in This Sampling Report.

Water Quality Area Uniform Numeric Codes for Station	Field Monitoring and Sampling Division Station Identification	Permits and Engineering Division Station Identification	Laboratory Station Identification
01-Sampling; PPD	Station Intake	Intake	General Electric Intake
02-Sampling; PPD	Backwash	Backwash; outfall 003	Backwash
03-Sampling and Dye Test; PPD	Station C-Sedimenta- tion Lagoons	Discharge 001-Sedimenta- tion Lagoons	Station C
04-Sampling and Dye Test; PPD	Station #1-Stormwater Runoff, Station B	Stormwater Runoff at Point #1; Outfall 004	Station #1; Station B
05-Sampling; PPD	Station #2- Dike Discharge	Station #2-Drum Storage Area	Station #2
06-Dye Test; PPD	PPD Bathrooms	PPD bathrooms	_
07-Sampling and Dye Test; PPD	Station 002	Discharge 002-PPD Inc.	Station 002
08-Sampling; CBI	Station A	Stormwater Runoff at Point #7	Station A
09-Sampling and Dye Test; CBI	Station 001- Effluent	Discharge 001-CBI	Station 001
10-Sampling; CBI	Stormwater Manhole	Stormwater Discharge at Point #13	Stormwater Manhole
11-Dye Test; CBI	Stormwater Discharge	Stormwater Manhole at Lunchroom	-
12-Dye Test; CBI	CBI Bathrooms	CBI Bathrooms	

<sup>\*</sup> This numeric code will be used througout this report. These sampling stations can be located in Figure 2 of Appendix C.

Table 2: Parameters and Permit Effluent Limitations Violated by PPD from Monitoring Periods May, 1981 through September, 1983.

Monitoring Period	Discharge / NPDES Permit Limitation	Reported Value	Compliance Factor
July, 1981*	002: Color 10 Pt/Co	25	2.5
August, 1981*	001: Ni 1.00 mg/l max.	3.65	3.65
	Ag 0.035 kg/day ave. 0.070 kg/day max.	0.037	1.06 1.04
	Zn 0.10 kg/day ave. 0.20 kg/day max.	0.31	3.1 2.0
	Sn 1.00 mg/1 ave. 2.00 mg/1 max.	4.75 9.40	4.75 4.70
September, 1981*	001: Ni 0.50 mg/l ave.	< 0.55	1.10
	Zn 0.10 kg/day ave. 0.20 kg/day max.	0.27 0.52	2.70 2.60
	002: Color 10 Pt/Co max.	60	6.0
	B 1.00 mg/l ave.	2.23	2.23
October, 1981	001: Ni 0.50 mg/1 ave. 1.00 mg/1 max.	0.80	1.60
	Ag 0.035 kg/day ave.	0.040	1.14
	002: Color 10 Pt/Co max.	15.00	1.5
November, 1981	001: Zn 0.10 kg/day ave. 0.20 kg/day mas.	0.17	1.7
	Ni 0.50 mg/l ave.	0.63	1.26
	002: Color 10 Pt/Co max.	2.0	2.0

Table 2 Continuation...

			<u> </u>
Monitoring Period	Discharge / NPDES Permit Limitation	Reported Value	Compliance Factor
March, 1982	001: Ni 500 ug/1 ave. 1000 ug/1 max.	1,100 1,520	2.2 1.52
April, 1982	001: Ni 500 ug/l ave. Cu	640	1.28
	500 ug/1 ave.	680	1.36
May, 1982	001: Ni 500 ug/1 ave. 1000 ug/1 max.	2,570 3,080	5.14 3.08
	Sn 1000 ug/1 ave. 2000 ug/1 max.	2,550 2,700	2.55 1.35
	Cu 500 ug/1 ave. 1000 ug/1 max.	1,030 1,170	2.06
June, 1982	001: Ni 500 ug/l ave. 1000 ug/l max.	3,770 9,800	7.54 9.80
July, 1982	001: Ni 500 ug/l ave. 1000 ug/l max	1,230 1,600	2.46
August, 1982	001: Sn 1000 ug/1 ave. 2000 ug/1 max.	1,600 3,200	1.60
	Cu 500 ug/1 ave.	745	1.49
	002: Color 10 Pt/Co max.	15	1.50
	Ni 500 ug/l ave. 1000 ug/l max.	1,590 2,340	3.18 2.34

Table 2 Continuation...

<del> </del>		L	
Monitoring Period	Discharge / NPDES Permit Limitation	Reported Value	Compliance Factor
September, 1982	001: Zn 0.10 kg/day ave. 0.20 kg/day max.	0.14	1.4 1.15
	Sn 1000 ug/1 ave. 2000 ug/1 max.	<b>∢</b> 1,900 3,700	1.9 1.85
	Ni 500 ug/l ave. 1000 ug/l max.	1,560 2,070	3.12 2.07
	002: Color 10 Pt/Co max.	25	25
October, 1982	001: Zn 0.10 kg/day ave. 0.20 kg/day max.	0.14	1.4 1.15
	Ni 500 ug/l ave. 1000 ug/l max.	2,860 4,400	5.72 4.4
November, 1982	001: Zn 0.20 kg/day max.	2.62	13.1
	Sn 1000 ug/1 ave. 2000 ug/1 max.	3,150 4,800	3.15 2.40
	Cu 500 ug/1 ave.	600	1.20
	Ni 500 ug/1 ave. 1000 ug/1 max.	1,590 1,790	3.18 1.79
December, 1982	001: Zn 0.10 kg/day ave. 0.20 kg/day max.	0.19	1.9
	Ni 500 ug/1 ave. 1000 ug/1 max.	990 1,140	1.98

Table 2 Continuation...

Monitoring Period	Discharge / NPDES Permit Limitation	Reported Value	Compliance Factor
January, 1983	001: Ni 500 ug/1 ave.	810	1.62
	002: Color 10 Pt/Co max.	20	2.0

Ave. = Daily average

Max. = Daily maximum

001 = Treated wastewaters from electroplating rinse waters.

Wastewaters consisting of a combination of non-contact cooling waters from compressor and molding, contact cooling water from welding, and storm water.

\* = Submitted Non-Compliance Notification for said monitoring period violations.

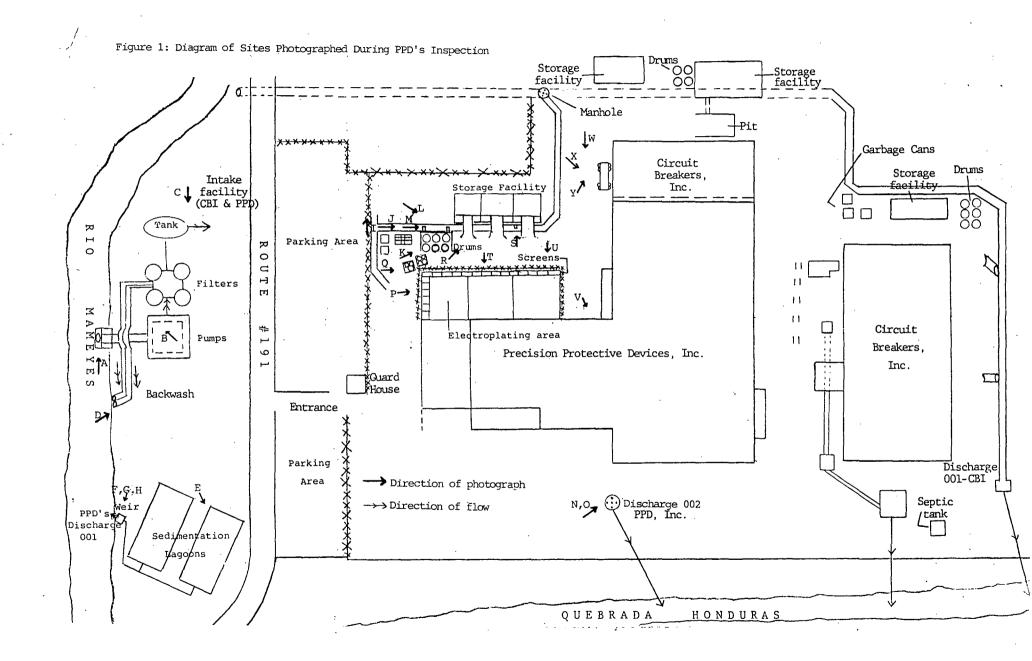


Figure 1: Location Map of PPD and CBI Facilities.

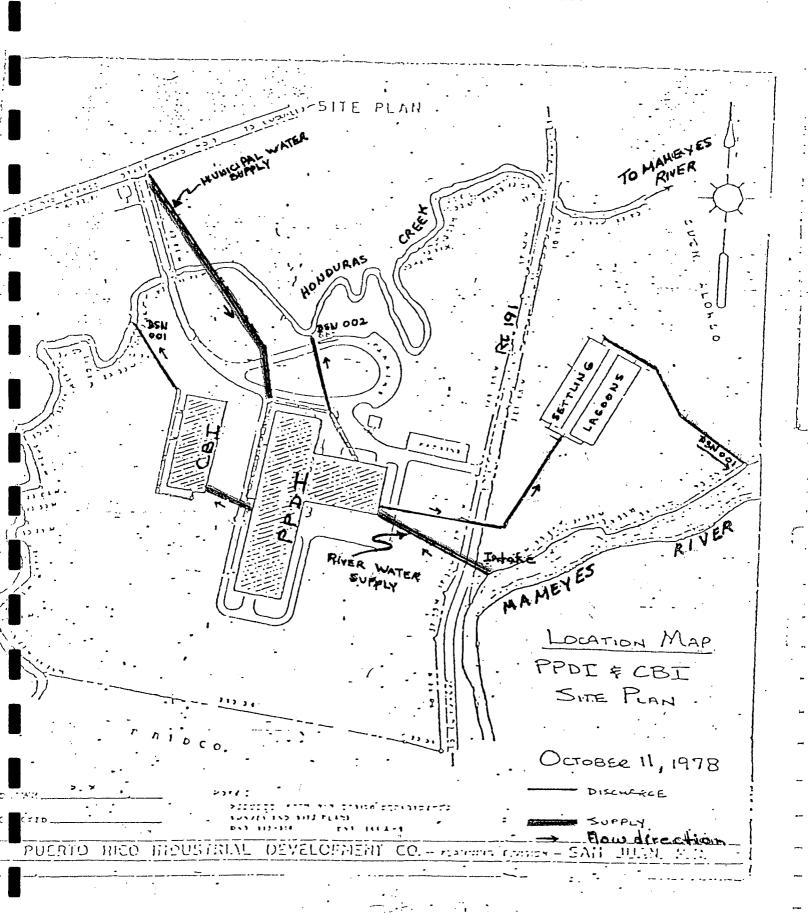


Table 1: Field Measurements of Grab Samples and Analytical Results of Composite Samples from the Effluent of General Electric Precision Protective Devices, Inc. at Palmer Rio Grande, and the Receiving Waters Compared to NPDES Permit Limitations and WOSR for SD Waters.

		FIEL	D MEASUREME	NTS	ANALYTICAL RESULTS					
		Temperature °C (°F)	pH SU	DO mg/l	TDS mg/1	TSS mg/l	Fe ug/l	B mg/l	Surfactants ug/l	
NPDES Permit Net Discharge Limitations Outfall 002		34.5 (94)	6.0-9.0	N/L	500.0 max.	40 max.	2.5 mg/1 max. (2,500 ug/1)	1.0 mg/l max. (1,000 ug/l)	N/L	
Station	07	27.5-30.0 (81.5-86.0)	6.5-7.5	7.1-8.1	94.5	7	268.8	27	N/A	
Station	01	23.5-26.0 (74.3-78.8)	6.6-7.8	7.65-8.6	119.5	. 3	137.0	13	172	
Net		+4 (+39.2)		-0.55	-25	+4	+131.8	+14	*	
Station 04**	Nov. 30	24.5(76.1)	6.8	4.1	N/A	N/A	N/A	N/A	N/A	
	Dec.	26.0(78.8)	N/A	N/A	N/A	N/A	N/A -	N/A	. N/A	
Station 002**		25.0(77.0)	7.5-7.6	7.7-7.8	N/A	N/A	N/A	N/A	N/A	
Station 003**		25.5(77.9)	- N/A	N/A -	N/A	N/A	N/A	N/A	- N/A	
WQSR for SD Waters		34.5 (94)	6.0-9.0	5.0 i	N/S	·N/S	300	1,000.0	100.0	

#### Table 1: Continuation

Max. = Daily maximum

Min. = Minimum concentration permitted

N/L = Not limited

N/S = No standard

N/A = Not analyzed

---- = Not applicable

- \* = Net concentration could not be calculated since no analysis was performed to the effluent samples for said parameter.
- \*\* = Results from one sample
  - = The negative sign implies that the contaminant was removed during the permittee's activities by said concentration.
  - + = The positive sign implies that the contaminant was increased by the permittee's activities by said concentration.

Table 2: Analytical Results of Grab Samples from the Effluent of General Electric Precision Protective Devices, Inc., Palmer, Río Grande and the Receiving Waters, Compared to NPDES Permit Limitations and WQSR for SD Waters.

		Color Pt/Co	Turbidity NTU	pH SU	DO mg/l	CN ug/1	Oil and Grease mg/l	Pb ug/l	Cd ug/1	Cr Total ug/l
NPDES Permit Limitation Outfall 002		10.0 max.	50.0 max.	6.0-9.0	N/L	N/L	(a)	N/L	N/L	N/L
Station 007 (Effluent Outfall 002		5 5	2.8	· N/A	N/A	N/A	0.9 0.3	7.9 7.9	0.00 0.00	32.6 16.1
Station 01 (Intake)		5 10	2.8	N/A	N/A	N/A	1.0	19.5 7.9	0.00	48.2 32.4
Net		0 -5	0.0				-0.1 -0.3	-11.6 0.0	0.00	-15.6 -16.3
Station 04	Nov. 30	N/A	N/A	N/A	N/A	N/A	44.3	48.3	3.30	202.4
	Dec.	N/A	N/A	6.70	3.13	9.28	10.1	317.6	9.80	163.9
Station 05		N/A	N/A	N/A	N/A	N/A	58.7	5.0	3.40	268.6
Station 02		15	36	N/A	N/A	N/A	N/A	10.8	1.40	52.6
Station 03		N/A	N/A	7.08	7.68	1.66	1.2	7.9	0.00	45.6
WQSR for SD Waters		10.0 max.	50 max.	6.0-9.0	5.0 min.	200.0	(b)	50.0	5.0	50.0

Table 2: Continuation

		Zn ug/1	Cu ug/l	Ag ug/l	Cl ug/l	NO3+NO2 ug/1	TDS ug/1
NPDES Permit Limitation Outfall 002		N/L	N/L	N/L	N/L	N/L	N/L
Station 0 (Effluent Outfall 0		219.1 230.6	53.9 53.9	26.60 0.00	N/A	N/A	N/A
Station 0 (Intake)	1	60.4	53.9 53.9	0.00	10,200 10,370	185 178	115 117
Net		+58.7 +26.8	00.0	-26.60 0.00	*	*	*
Station 04	Nov.	826.2	191.3	10.60	N/A	N/A	N/A
	Dec. 2	2,348.8	696.9	11.60	N/A	N/A	N/A
Station 0	Station 05		145.5	16.40	N/A	N/A	N/A
Station 02		137.4	99.7	0.00	N/A	N/A	N/A
Station 03		70.9	168.4	2.20		N/A	N/A ,
WQSR for SD Waters		50.0	40.0	2.00	250,000	10,000	N/S

## Table 2: Continuation

Max. = Daily maximum

Min. = Minimum concentration permitted

N/A = Not analyzed

N/L = Not limited

N/S = No standard

- (a) = Permit states that "No visible oil film or globules or grease are permitted".
- (b) = Section 2.1.1 of Puerto Rico's WQSR states that the waters of Puerto Rico shall not contain oil attributable to discharge in amounts sufficient to be unsightly or deleterious.
  - \* = Net concentration could not be calculated since no analysis was performed to the effluent sample for said parameter.
  - = The negative sign implies that the contaminant was removed during, the permittee's activities by said concentration.
- + = The positive sign implies that the contaminant was increased by the permittee's activities by said concentration.

---- = Not applicable

## BACKGROUND

## PRD 090510793

On December 2 and 5 of 1983, an inspection was performed to Precision Protective Devices, Inc., Road 191, Km.05, Palmer, Luquillo, P.R..

The purpose of the visit was to perform a Full RCRA Generator and TSD Facility inspection in accordance to the State Regulation, Regulation for the Control of Hazardous and Non-Hazardous Solid Wastes, amended version, March 5, 1982.

During the inspection performed on December 2, 1983, Mr. Edwin Rosario, Maintenance Manager, met with Mrs. Yazmin López of the Land Pollution Control Area. Since the person in charge of the environmental aspects of the company was not present to answer some questions, the Full RCRA inspection was continued on December 5, 1983. During this last inspection we met with Mr. Manuel M. Sánchez, President/Plant Manager, and Mr. Gilberto Rivera, P.E./Specialist Env. Programs.

As stated by Mr. Sánchez and Mr. Rivera, G.E. Precision Protective Devices manufactures residential circuit breakers. The facility has an interim status to treat and store in tanks, containers and in surface impoundments of certain hazardous wastes related to its electroplating, painting, and wastewater treatment activities.

The hazardous wastes that the company listed in the Part A, dated 10/16/80 were:

- 1. FOO6 Waste Water Treatment sludge from electroplating operations.
- 2. F008 Plating bath sludges from the bottom of plating baths from electroplating operations.
- 3. F009 Spent stripping and cleaning bath solutions from electroplating operations.
- 4. F017 Paint residues generated from industrial painting.
- 5. D002 Plating bath sludges.

The electroplating operations of P.P.D. once consisted of 11 tanks located on the West side of the manufacturing area. These tanks were connected to two 500 gallon holding tanks. There was also an additional tank for chromate rinse solution and a neutralization tank with a capacity of 2,400 gal/hour.

## Background

The plating bath sludge was carried thru underground pipes to two concrete lined surface impoundments. Each impoundment being 68' x 250' of 76,290 gallons capacity each one.

Since December 14, 1982, the industry eliminated the electroplating operations, closing the tank area. These tanks were empty at the time of the inspection and the neutralization and holding tanks were removed.

As stated by Mr. Rivera, the company did not submit a Closure Plan for the tank area. On letter dated February 14, 1983, the industry informed the Water Compliance Section of Region II, N.Y., the elimination of the PPDI electroplating operation and thus, DSN 001 (discharge).

The Environmental Quality Board was never informed of the closure of the tanks notified in their Part A dated 10/16/80.

The surface impoundments are still used for the storage of the bath plating sludges. The industry is planning to prepare a Closure Plan for the surface impoundments. In this Closure Plan they will include the area next to the lagoons, where sludge had been disposed off for some time.

The industry also has a drum storage area, one area for storing acids and the other area for the rest of the wastes. In these areas they store the waste that the company is generating, which are: solvents, wastes oils, and paint residues.

General Electric Precision Protective Devices installed a Ground-Water Monitoring System for the surface impoundments. This Ground-Water Monitoring System has been evaluated by Ertec.

The following deficiencies were found by Ertec:

- 1.265.91 (a) (1)
  804.B-1 The location of the hydraulically upgradient monitoring well is not sufficient to yield groundwater samples that are representative of background groundwater quality in the uppermost aquifer.
- 2.265.92 (a) (4) 804 C-1 (d) The ground water sampling and analysis plan does not ensure chain of custody control.

All of the above mentioned information, was personally read and observed by:

Yazmin Lopez Vázquez

#### SUMMARY OF FINDINGS

On December 2 and 5, 1983, an inspection was performed to Precision Protective Devices, Inc. Road 191, Km. .05, Palmer, Luquillo, Puerto Rico.

The purpose of the visit was to perform a Full RCRA Generator and TSD Facility inspection in accordance to the State Regulations, Regulation for the Control of Hazardous and Non-Hazardous Solid Wastes, amended version, March 5, 1982.

During the inspection performed on December 2, 1983, Mr. Edwin Rosario, maintenance manager, met with Mrs. Yazmín López of the Land Pollution Control Area. Since the person incharge of the environmental aspects of the company was not present to answer some questions, the Full RCRA inspection was continued on December 5, 1983. During this last inspection we met with Mr. Manuel M. Sánchez, Presidet/Plant Manager, and Mr. Gilberto Rivera, P.R./Specialist Env. Programs.

The following information was gathered:

## A. General Information

1. Since December 14, 1982, the industry eliminated the electroplating operations, closing the tank area that is reported on their Part A.

This closure was performed without notifying the Environmental Quality Board.

- 2. At the time of the inspection, the company had not updated the following documents:
  - a. Contingency Plan
  - b. Daily log book
  - c. Inspection performed
  - d. Closure Plan
  - e. Personnel Training
  - f. Operating Records
- 3. According to the Industry Waste Storage Records, included in the Operating Records; on April 30, 1982 a sludge from the plating bath, was transported under the Manifest number 001.

The company did not have a copy of the Manifest and it was not submitted to the Environmental Quality Board.

## Summary of Finding

- 4. During the inspection, copy of the following documents were provided:
  - a. Waste Analysis Plan
  - b. Contingency Plan
  - c. Inspection performed on 1981 to the containers and tanks storage area.
  - d. Daily log book, up to 12/1982, is incomplete.
  - e. Closure Plan

The above mentioned documents were not updated.

- 5. At the moment of the inspection, the company did not have a copy of the following documents:
  - a. Personnel Training
  - b. Manifest Records
  - c. Operating Records

## B. Surface Impoundment

- 1. In the impoundments are still stored the sludges from the electroplating operations.
- 2. At the moment of the inspection, the freeboard level maintained was less than two (2) feet
- 3. Vegetation was covering part of the surface impoundments.
- 4. As indicated by Mr. Rivera, the industry is planning to prepare a Closure Plan for the surface impoundments. In this Closure Plan will be included the area next to the impoundments where they suspect that sludge was disposed off for some time.

# C. Containers Storage Area

- 1. Acids Storage Area
  - a. Has a roof and is totally enclosed.
  - b. Has a concrete base. This base was corroded ( see pictures).
  - c. Has a fire extinguisher
  - d. Has dikes ( secondary containment system) this dike was filled with liquid.
  - e. The container storage area is at least 50 feet from the facility property boundary.
  - f. Approximately 12 cardboard containers of different volumes were stored. Some were in bad conditions.

- g. One plastic container, containing sulfuric acid was stored.
- h. Two containers of about 35 gals. were stored. These containers were broken.
- i. The base was corroded.
- j. Wastes was spilled on several places in the storage area.
- k. Most of the containers were not labeled.
- 1. We observed a white dust inside a plastic bag, deposited on the concrete base.
- m. Spilled material was observed outside the storage area.

## 2. General Wastes Storage Area

- a. Has a roof and is totally enclosed.
- Has continuous concrete base.
- c. Has fire extinguisher and an eye washer.
- d. Has a dike. It was filled with liquid.
- e. The container storage area is at least
   50 feet from the facility property boundary.
- f. The wastes stored were the following:
  - 1. Waste Oil
  - 2. Nickel Plating Sludge
  - Solvents
  - 4. Paint residues
- g. On the inspection performed on December 2, 1983, we observed 29 containers of 55 gal. each one.
- h. On the inspection performed on December 5, 1983, we observed 86 containers of 55 gal each one and about 15 of other types of containers.

The reason for the increase in the quantity of containers was because the ones containing solvents were removed from the tanks area, to this storage area.

- i. Only 7 drums were labeled
- j. Five drums containing electroplating sludge were open.
- k. We observed corroded tanks and in bad conditions.
- 1. One container showed evidence of leakage (see picture)
- m. There was no aisle space between containers (see picture).
- n. A small pile of electroplating sludge was disposed over the concrete base.
- o. Spilled material was observed outside the storage area.

#### D Tank Area

- Neutralization tank and holding tanks were removed.
- Electroplating tanks were empty. 2.
- The area has not been decontaminated.

On the inspection performed on December 2, 1983, we observed nickel electroplating sludge, spilled over this area. It was removed before the inspection performed on December 5, 1983.

- The dikes were filled with liquid and overflowing.
- On the inspection performed on December 2, 1983, we observed about 50 drums of 55 gal each one, containing solvents, as indicated by Mr. Rosario.

The containers were not labeled. These containers were moved to the hazardous wastes storage area.

The hazardous wastes storage area did not comply with the requirements of RCRA.

All of the above mentioned information, was personally observed by:

> Yazmin Lopez Vazquez Principal Env. Inspector

E.Q.B.

COMMONWEALTH OF PUERTO RICO OFFICE OF THE GOVERNOR ENVIRONMENTAL QUALITY BOARD



Compliance Sampling Report on Precision Protectives Devices, Inc.
NPDES PR 0000671

Water Quality Bureau Permits Division 1982

- 6- Give an accurate description of how you will decontaminate the concrete blocks. How can you ensure they are not contaminated before you dispose them in a municipal landfill?
- 7-State who will be performing the pumping collection and/or transportation of any material during the closure of the facility.
- 8- On page 5 you stated that the liquids will be shipped to another General Electric site on Puerto Rico for treatment... you must state to which site in particular you will ship these liquids and include a possible alternate plant.
- 9-Describe the field operations technics to be implemented for the separation of sludge from roots, rocks and other non-pumpable materials. State the whereabouts of the used or residual waters during decontamination. (265.114)
- 10- Itemize the equipment to be utilized for the closure activities, provide and accurate description of the decontamination procedures to the utilized equipment. State criteria to determine if some equipment will be properly decontaminated or will require disposal. (265.114).
- 11- How would the concrete block baffle walls will be torn down?
- 12- Estimate the personnel that will be working in the proposed closure activities. How much time you estimate will be necessary to close each impoundment?
- 13- Explain what is your definition of a California criteria?

In addition to the previously mentioned items that must be clarify there are also several major issues that should be considered, revised or modified such as:

a. For the closure activities you intent to construct a sludge disposal area besides the impoundments. We consider that such procedure is inadequate. A different procedure should be considered.

As indicated in previous documentation, sludge from the electroplating operations at PPDI were disposed of in a sludge disposal area next to the lagoons in a period between 1972 and 1974. You did not mentioned anything about the decontamination and closure of said sludge disposal area... Provide records of

such disposal practices or the quantities of material disposed; inform lift any sampling activities have been practiced to that area; describe how would you restore or decontaminate the area.

- b. After this CP evaluation we noticed that you will depend to much on air drying for the closure activities...you have to realize that the impoundments are located right by Puerto Rico's tropical rain forest (El Yunque); and the area is very humid. Air drying could be simply impossible on certain seasons. In fact at the moment of the inspection a great volume of standing liquids were present.
- c. We consider that a period of one year is too extensive for the closure activities. If you need more than the stipulated 180 days you will have to demonstrate it in your petition since we estimate that 180 days are sufficient.
- d. You have stated that, "prior to initiation of specific closure activities a supplemental sludge/soil sampling and analysis program will be conducted, and that this plan is attached as Appendix A"... Our personnel has evaluated the submitted plan, and considered it to be unacceptable. EQB will demand that the demonstration of clean closure will have to be using total background values as a comparison means, because of the following explanations, that where given by Law Engineering.
  - on the section regarding "ground-water quality" you have stated that samples were collected from the monitor wells (DEC. 9,10, 11, 1981), and also that replicate samples were sent to the Law Engineering Chemical Laboratory for comparison". However, significant differences in the concentration of Al, Cr and Cyanide were noted, but you alleged that results indicate that the operations of the lagoons is not resulting in significant degradation in ground-water quality.
  - "Chromium concentration appears to be borderline for trivalent chromium to convert to the hexavalent".
  - "Cyanide concentration in samples from wells U-1/D-1 exceed drinking water standards".
  - "ph of water well D1 (up) is high":

"Phenol concentration in samples from wells D1/D3 exceed drinking water standards".

If you have any questions please, contact either Roberto Berberena or Pedro Vélez at 725-8992.

Cordially,

Jesús M. Medero Director Land Pollution Control Area

RB/JMM/dsf

cc: Barry Tornick Chief, Permit Section EPA - N.Y.

REFERENCE 9

SAMPLING AND ANALYSIS OF PLANT AREA SOILS
PRECISION PROTECTIVE DEVICES, INC.
PALMER, PUERTO RICO

Prepared By

LAW ENVIRONMENTAL SERVICES

MARIETTA, GEORGIA

January 29, 1985

#### INTRODUCTION

The available information indicated the potential for near surface soil contamination associated with past operations at the plant. These operations included the potential for surface disposal of sludge. There was also potential for surface runoff to have contaminated the soils in a drainage ditch leading from this area. The area of concern is immediately south of the Precision Protective Devices, Inc. (PPDI) main plant building and hazardous waste storage area as shown on Figure 1 (Appendix A). PPDI requested that Fernando L. Rodriguez and Associates (FLRA), a local consultant, prepare a sampling and analysis plan. The plan was prepared by FLRA in June 1984, and approved by EQB at a meeting with FLRA on June 25, 1984.

#### SAMPL ING

The sampling procedures utilized generally followed the FLRA plan. Sampling was conducted by N. G. Schmitt of Law Engineering, G. Rivera of GEPRO, I. de Jesus of EQB, W. O'Neill of EQB, F. L. Rodriguez of FLRA and Y. Reyez of FLRA on August 2 and August 3, 1984.

A total of 18 soil samples were obtained on August 2 and 3, 1984. These included 2 background samples, 4 runoff channel samples and 12 samples from the past potential disposal area. The sampling areas are shown on the appended Figure 1, with Figure 2 showing the detailed sample locations.

cyanide analysis was used to determine if contamination or any "memory" effects were occurring.

- 4. Check standards were analyzed after approximately every 15 samples to verify stability on the calibration curve.
- 5. One duplicate sample was run for every 10 samples. A duplicate sample is a sample brought through the whole sample preparation process.
- 6. Spiked samples or standard reference materials were periodically employed to ensure that correct procedures were being followed and that all equipment was operating properly.
- 7. The method of standard additions was used for the analysis of all of the EP extracts.

The soil samples were also analyzed for total sulfide and total cyanide in order to provide a conservative evaluation of reactivity. Total sulfide was extracted by distillation of the sample with hydrochloric acid solution in accordance with reference (1) and measurement of total sulfide was performed in accordance with EPA Method 9030 (reference 2). Total cyanide was determined in accordance with EPA Method 9010 (reference 2) with a colorimetric finish as described in Method 335.2 of reference 3.

## ANALYSIS RESULTS AND CONCLUSIONS

Detailed results of the analyses of the "B", "D" and "S"

samples are provided on Table B-1 - Laboratory Analysis Summary (Appendix B). Only 10 concentrations of metals analyzed according to EP toxicity procedures were found above detection limits at the sludge disposal, ditch and background locations sampled on August 2 and 3, 1984. Chromium was detected in 5 samples with the highest level of 0.3 mg/l found in the background sample (B-2). Lead was detected at 0.3 mg/l in the 2 to 4-foot depth sample at S-1 location and at 0.8 mg/l in the S-3 sample at 4 to 6-foot depth. Both of these samples containing lead above detection limit are from the potential disposal area.

Three samples, two from the potential sludge disposal area and one from the ditch, were analyzed for tin and zinc in accordance with EP toxicity procedures. Tin was not detected above the 1 mg/l detection limit. Zinc was found in each of the three samples with concentrations of 0.26 and 0.40 mg/l in the potential sludge disposal area (2-4 foot depth at S-l and 6-8 foot depth at S-3 locations respectively) and 0.80 mg/l in the surface sample at ditch sample point number 4.

One surface sample taken by Law Engineering adjacent to the eastern edge of potential sludge disposal area in June 1984 (designated sample P-1 as shown on appended Figure 2) contained 0.2 mg/l lead with the remaining metals analyzed being below detection limits. The total metals analysis on this particular sample indicated chromium, copper and zinc concentrations between 1400 and 2600 mg/kg and tin at 970 mg/kg. The total metals concentrations were the result of a much more rigorous digestion procedure (Method 3050, reference 2, except for mercury which was

digested in accordance with Method 7471), where nitric acid was used to dissolve all metals inherent in the sample except for those that are part of the interlocking crystalline structure.

Based on the EP toxicity analysis results, the soils sampled in the background, potential sludge disposal and adjacent ditch locations are non-toxic. With the low concentrations of sulfide and cyanide (less than or equal to 200 mg/kg) determined by the total analysis (pH of extract below 2) and with no noticeable odor detected for the extract; toxic gases, vapors or fumes can not be generated in sufficient quantity from the soils sampled in the plant area for these soils to be considered a hazardous waste based on reactivity.

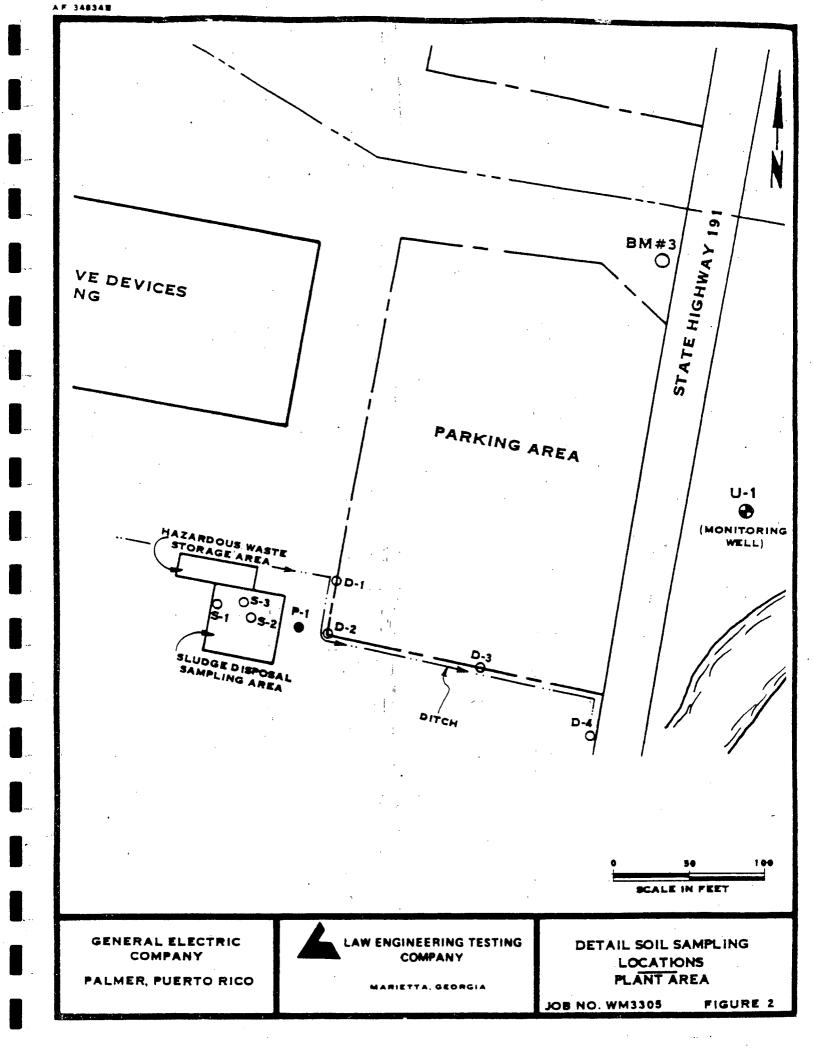


TABLE B-1

# LÁBURATURY ANALYSIS SUMMARY - PLANT AREA SUILS

# PRECISION PROTECTIVE DEVICES, INC.-PALMER, P. R.

		•				ŁP.	TOXICITY	(MG/L)					
SAMPLE DATE	SAMPLE LOCATION	ARSENIC	BAR 1Uh	Cabhlum	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER	TIN	ZINÜ	TOTAL SULFIDE	TOTAL
8/2/84	BACKGROUND							•	-			,	••
	B-1 (2')	(0.1	(1)	(0.05	(Ū.1	(0.2	(0 001	(0.05	(0.05			(100	0 2
	8-2 (2')	(0.1	<b>(1</b> .	(07,05	0.3	(0.2	(0.001	(0.05	(0.05				0.2
8/2/84	DITCH												
	D-1 (SURFACE)	(0.1	<b>(1</b> .	(0.05	<0.i	(0.2	(0,001	(0.05	(0.05			(100	0.1
	D-2 (SURFACE)	(0.1	(1.	(0.05	$\emptyset > 1$	(0.2	(0,001	(0.05	< 0.05			< 1 0 Ú	0 1
	D-3 (SURFACE)	(0.1	<b>(1</b> .	(0.05	(0.1	(0.2	(0.001	(0.05	(0.05			100	1 9
ž.	D-4 (SURFACE)	(0.1	<b>(1</b> .	. (0.05		(0.2	(0.001	(0.05	(0).05	(1)	0.80	500	. 0 4
8/2/84	SLUDGE DISPUSAL AR	ÉA	- "		t the world							Arman y	
	S-1 (0'-2')	(0.1	-(1.	(0.05	(0.1	(0 2	(0.0)1	(0.05	(0.05			<100	(0.1
	S-1 (2'-4')	(0.1	<b>(1</b>	(0.05	(0.1	v, $3$	(0.001	(Ú.05	(0.05	<b>(1</b> .	0 26	(100	0 1
	S-1 (4'-6')	(0 i	(1.	(0.05	(0.1	(0.2	(0.001	(0.05	(0.05			(100	0.2
•	5-1 (6'-8')	(0.1	<b>(1</b> .	(0.05	(0.1	(0.2	(0.001	(0)05	(0.85			(100	(0 1
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6/4/84	PLANT PILE (P-1)	(0.05	<b>(1</b> .	(0.05	(0.1	0.2	(0 001	(0 05	(0-05			11	6 2
								:					•
SAMPLE	SAMPLE						METALS	(MG/KG)					
DATE	LOCATION	ARSENIC	BAR LUM	CADMIUM	CHROMIUM	COPPER	MERCURY	SELENJUM	SILVER	111	ZINU		
	OF SOIT TOTALE TO SA	14	Qΰ	<b>V</b> -)	1440	9688	/ fi 3	/ \		62A	1.7711		

REFERENCE 10

SOIL SAMPLING AND ANALYSES NEAR THE LAGOONS
PRECISION PROTECTIVE DEVICES, INC.
PALMER, PUERTO RICO

Prepared By

LAW ENVIRONMENTAL SERVICES

Marietta, Georgia

January 23, 1985

### INTRODUCTION

Available information indicated that in the past there may have been surficial disposal of sludges from the lagoons in the area to the south of the lagoons. The exact area is not known, however, the general area of this potential disposal is indicated on the attached Figure 1. As a part of the lagoon pre-closure testing program and in response to a request for additional information by Mr. L. C. Peterson of General Electric, this area was sampled on June 4, 1984 in conjunction with other site monitoring activities.

### SAMPL ING

Sampling locations (Figure 2) were based on site reconnaissance and on-site discussions with plant personnel. An attempt was made to sample areas most likely to indicate contamination based on past practices.

After removal of surface vegetation, the upper six inches of soil was sampled with a hand trowel. Samples were enclosed in double plastic bags and sent back to our Marietta, Georgia laboratory in a sealed crate. Between samplings the trowel was wiped clean with paper towels.

### LABORATORY ANALYSIS

Because the nature of the materials potentially deposited in

In addition to the above described analyses for EP toxicity and total metals, the samples were analyzed for total sulfide, total cyanide and thermal stability. The total sulfide and total cyanide concentrations are an indication of potential reactivity. Total sulfide was extracted by distillation of the sample with hydrochloric acid solution in accordance with reference (1) and measurement of total sulfide was performed in accordance with EPA Method 9030 (reference 2). Total cyanide was determined in accordance with a colorimetric finish as described in Method 335.2 of reference 3.

Moisture content of each soil sample (ratio of water in the soil sample to the weight of solid particles expressed as a percent) was determined in accordance with American Society for Testing and Materials, Method of Test Designation 2216.

### ANALYSIS RESULTS AND CONCLUSIONS

No direct visual evidence of sludge was noted in the soil samples retrieved from the area between the lagoons and the Rio Mameyes (Figure 2). Results of the EP toxicity analysis (Table B-2) found the soil samples to be non-toxic.

The results of the analysis for total metals (Table B-1) found barium having the highest concentration at 340 to 490 mg/kg with the remaining metals having concentrations below 160 mg/kg. We believe the concentrations of barium reflect natural geologic conditions rather than effects of past disposal practices. The total metals analysis are therefore concluded to indicate a non-

hazardous condition in the area sampled.

With the low concentrations of total sulfide and cyanide (5 mg/kg or less for sulfide and less than 0.5 mg/kg for cyanide) determined for the soils sampled in the lagoon area, these soils are not considered hazardous from the standpoint of reactivity.

### REFERENCES

- 1 <u>Chemical Analysis of Ecological Materials</u>, Section 66.1, Stewart E. Allen, ed., John Wiley & Sons, New York, 1974.
- 2 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, second ed., U.S. Environmental Protection Agency, Washington, D.C., 1982.
- 3 Methods for Chemical Analysis of Water and Wastes, U.S.
  Environmental Protection Agency, Cincinnati, Ohio, Mar. 1983.

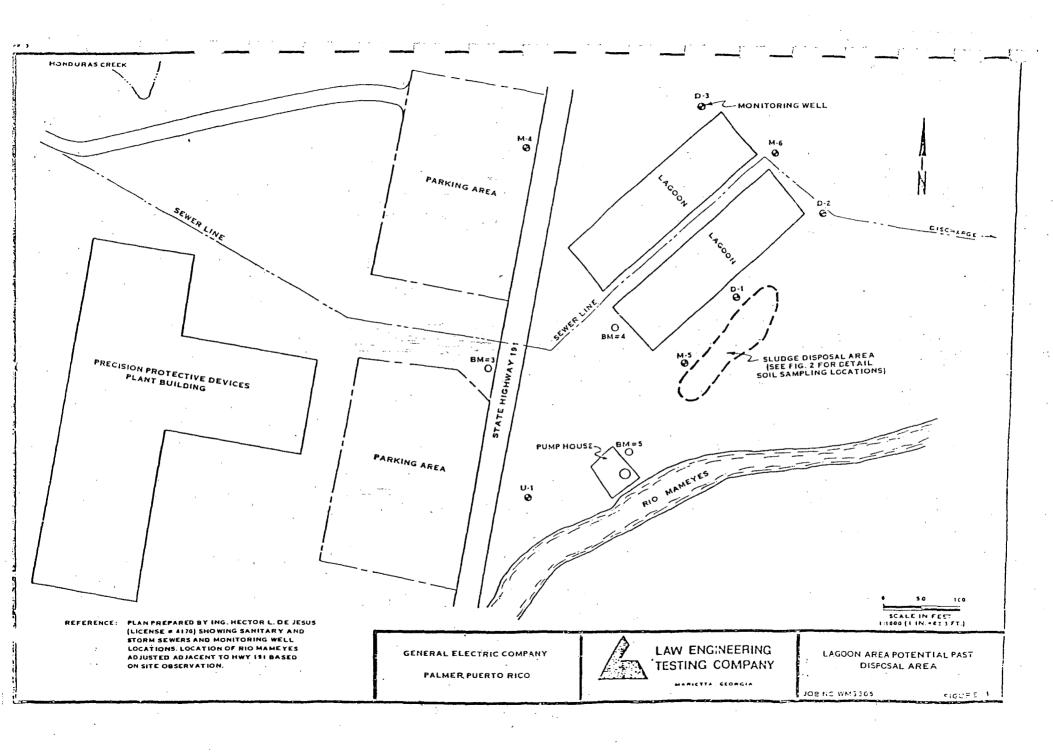


TABLE B-1
LABORATORY ANALYSIS SUMMARY
LAGOUN AREA SUILS SAMPLED JUNE 4, 1984
PRECISION PROTECTIVE DEVICES, INC. - PALMER, P. R.

		ED TOVIC	TTV MCTA	C (MC())		MAX. CONCENTRATIONS
CAMPLE NO				"3 (ПБ/С).	-	FOR CHARACTERISTIC
SAMPLE NO. :	<u> </u>	2	3		<u> </u>	OF EP TOXICITY (mg/l)
ARSENIC						5.0
	(1.					100.0
CADHIUM		(0.05				1.0
	<0.1				<0.1	5.0
LEAD	(0.2				(0.2	5.0
MERCURY	<0.001	(0.80i	<0.001	(0,00i	(0.001	0.2
SELENIUM	(0.05	(0.05	<0.05	(0.05	(0.05	1.0
SILVER	(0.05			(0.05	(0.05	5.0
			. METALS			
SAMPLE NO. :	1		3	4	5	
						<b>-</b>
	<b>(1</b> .				<b>(i</b> .	
BARIUM	340	490.	440.	<b>380</b> .	460.	
CADMIUM	1.9	0.1	0.1	0.4	0.1	
		<b>76</b> .			74.	•
COPPER	90		89			
			(0.3		(0.3	
					<b>(1</b> .	
TIN	70.	27	<1. 32.	34.	32	
ZINC	160.		93.		92.	
TATAL OF CIRCLES MAN					 5.	· <b>-</b>
TOTAL SULFIDE (MG/KG)						
		0.5		0.2	0.5	
THERMAL STABILITY				BSERVED		
HOISTURE CONTENT (%)	29.2	23.2	27.6	23.3	22.9	

REFERENCE 11

CLOSURE PLAN &
CERTIFICATION
HAZARDOUS WASTE
FACILITY

prepared for:

PRECISION PROTECTIVE DEVICES, INC. PALMER, PUERTO RICO

hva

FERNANDO L. RODRIGUEZ, P.E. & ASSOCIATES HATO REY, PUERTO RICO

FEBRUARY; 1984

### INTRODUCTION

Precision Protective Devices, Inc. (PPDI), EPA Id. No.

PPDI has ceased its electroplating operations since December, 1982. Recently, the plant's management have decided to finally close the treatment and storage facilities for their electroplating wastes. In the future, spent solvent wastes and lubricating oils generated in their manufacturing processes will be stored for less than ninety (90) days at the existing facilities.

This Closure Plan is presented according to the requirements of 40 CFR 265.110 through 265.228 of the federal regulations, and to Rule 805 of the Environmental Quality Board (EQB) "Regulations for the Control of Hazardous and Non-Hazardous Solid Wastes". This plan identifies all steps that are being taken to close the existing hazardous storage and treatment area of the facility in an environmentally safe manner. A separate report will be submitted to address the closure of the existing surface impoundments at the facility.

### 1.0 FACILITY DESCRIPTION

This section provides a general description of the hazardous waste treatment and storage facility at Precision Protective Devices, Inc. (PPDI). It is located in Palmer Ward, Municipality of Rio Grande, Puerto Rico, State Road No. 191, Km. 0.05. The facility mailing address is:

Precision Protective Devices, Inc. P.O. Box 377 Palmer, P.R. 00721

Mr. Manuel M. Sanchez is its President/Plant Manager, who can be located at (809) 887-2050.

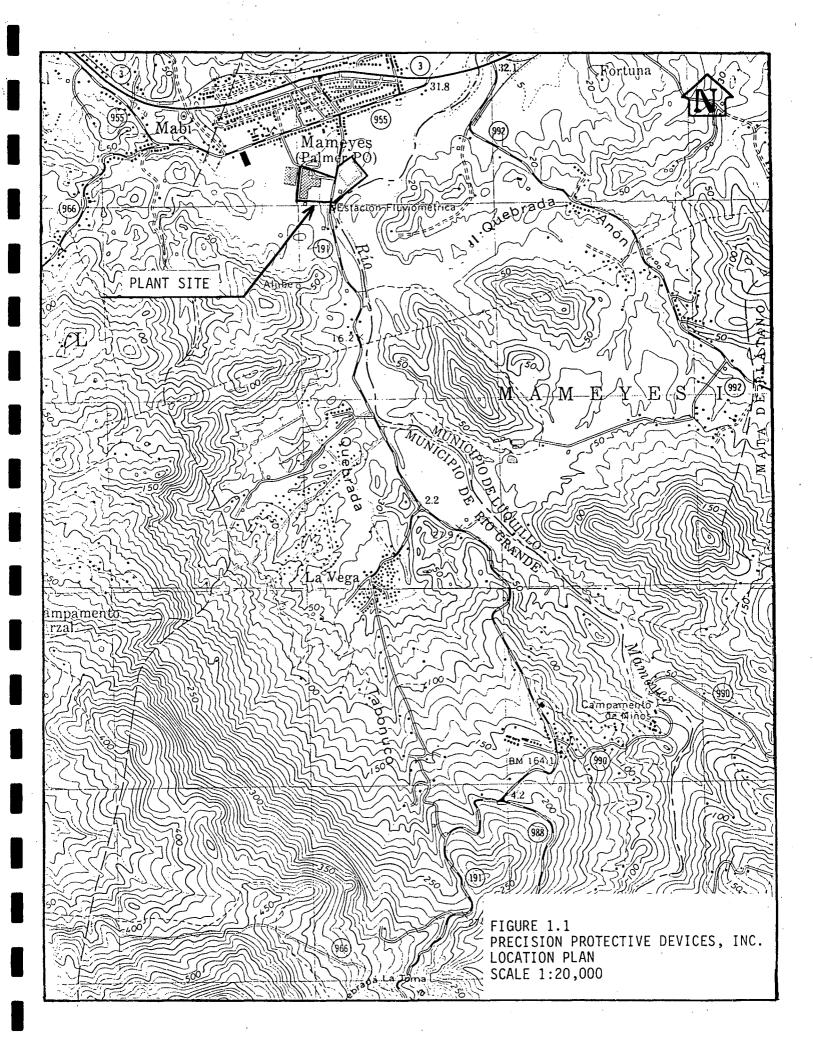
PPDI manufactures residential circuit breakers. Its operations included molding, resistance welding, fabrication and assembly operation.

Wastes generated at the facility consist of cooling water and lubricating oils, and those classified as hazardous such as wastewater treatment sludge (F006), plating bath sludges (F008), spent stripping and cleaning bath solutions (F009), spent plating bath solutions from electroplating operations (F007) and spent solvents (F001) from manufacturing operations.

### 1.1 GEOGRAPHIC AND OTHER RELATED FEATURES

Figure 1.1 shows a general location map of PPDI facilities. The plant is located in an area zoned as industrial by the Puerto Rico Planning Board (PRPB).

The Mameyes River flows along the southwestern boundary of PPDI.



### 1.2 PROCESS INFORMATION

The electroplating operations at **PPDI** consist of both an automatic and a manual production lines. The lines have the following units (these processes have been eliminated since December, 1982):

Plating process - Automatic Line

- (1) Tank No. 2, soak clean, 275 gallons capacity
- (2) Tank No. 3, electro-clean, 240 gallons capacity
- (3) Tank No. 5, acid dip, 200 gallons capacity
- (4) Tank No. 8, zinc plate, 250 gallons capacity
- (5) Tank No. 11, acid tin, 240 gallons capacity
- (6) Tank No. 14, nickel plate, 470 gallons capacity
- (7) Tank No. 18, blue-brite chromate, 200 gallons capacity
- Plating process Manual Line
  - (1) Tank No. 1, soak clean, 200 gallons capacity
  - (2) Tank No. 2, electro-clean, 200 gallons capacity
  - (3) Tank No. 3, acid dip, 200 gallons capacity
  - (4) Tank No. 4, silver plate, 200 gallons capacity

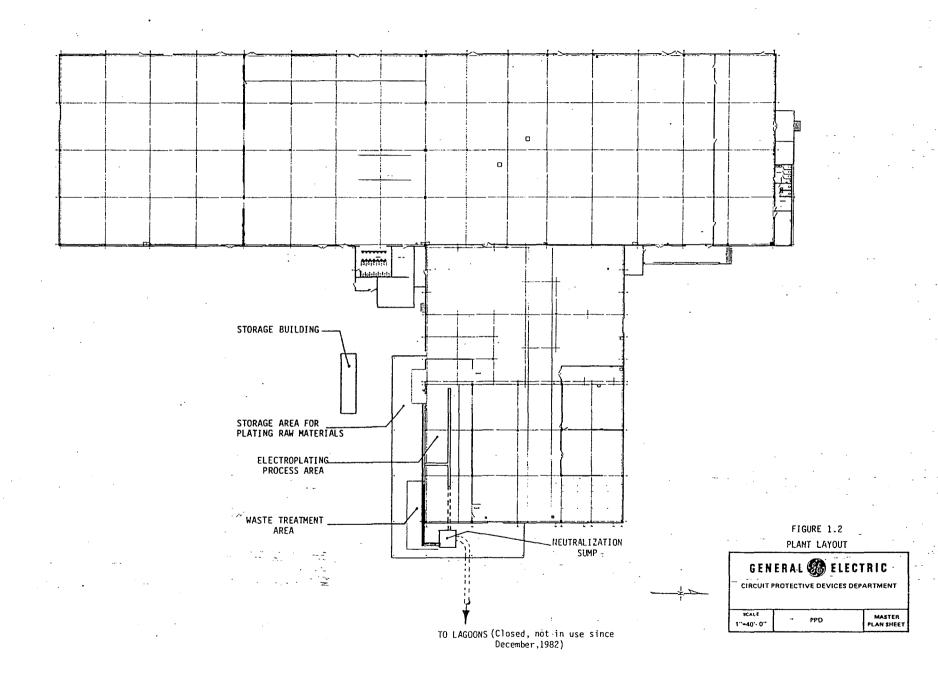
On November 16, 1980, PPDI submitted the "Part A" Application to the Environmental Protection Agency (EPA) and to the local Environmental Quality Board (EQB). The data presented showed that the wastes from electroplating operations are treated in tanks; and stored in containers, tanks and two (2) surface impoundments.

These tanks are part of a plating wastestream treatment system which consists of cyanide treatment, chromium treatment and neutralization with a capacity of 2400 gallons per hour. This plant discharges to the surface impoundments at the facility, and are regulated under a National Pollutant Discharge Elimination System (NPDES), Permit No. PR0000671. No other type of treatment exists at the facility.

All electroplating sludges were generated from the electroplating operations decanted solids were stored in drums, the liquid phase was discharged into the surface impoundment after neutralization treatment.

In addition, the facility generates spent trichloroethane (solvent) and used lubricating oils from its manufacturing operations. These wastes were stored in 55-gallons drums.

Figure 1.2 shows a layout plant of the facilities.



PLANPRINT. System 0577

### 2.0 CLOSURE PERFORMANCE STANDARDS

This closure plan was designed to ensure that the facility will not require further maintenance and controls, minimizes or eliminates threats to human health or the environment, and avoids movement of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or to the atmosphere. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil and, if necessary, in groundwater. Any contaminated soil will be excavated, removed, and disposed of at an approved disposal facility. The following sections discuss in detail efforts to be made at PPDI to satisfy the closure performance standards.

### 3.0 MAXIMUM WASTE INVENTORY

The maximum inventory of wastes that has been stored in containers at PPDI are ten, 80-gallons drums of plating sludges and nine, 55-gallons drums of spent trichloroethane. It is expected to collect a maximum of 20 drums of contaminated soil and rags from the facility's decontamination procedure.

Plating sludges were shipped to Ashland Chemicals facility, in Catano, Puerto Rico to be disposed at the Chemical Waste Management facility in Emelle, Alabama. Oils have been shipped to Hydrocarbon Recovery Co. for reprocessing.

Samples have been taken of the solvent waste by Ashland for \_\_\_\_\_\_ analyses. Diposal is pending to results.

### 4.0 WASTE INVENTORY: REMOVAL AND DISPOSAL

The maximum waste inventory will be disposed of at an EPA - approved TSD facility in the U.S. Mainland.

Plating solutions in tanks were transferred into 55-gallons drum and transported to General Electric Gepol, Inc. (GEPOL) facility located in Arecibo, Puerto Rico. This facility is an affiliate of PPDI. These solutions were reused in GEPOL's manufacturing operations.

The complete electroplating system, as well as the existing wastewater treatment plant along with electroplating raw materials were sold to Dorado Electroplating, Inc. plant, located at Dorado, Puerto Rico. Refer to the Appendix section for those "debit memos" that reflect and certified the transference and/or sales of equipment and materials to the above mentioned companies.

### 5.0 CLOSURE PROCEDURE

This section presents the procedures that are being followed at PPDI to close its treatment and storage area. The work will be supervised and performed by qualified personnel, following the guidelines established in Section 7.0, "Health and Safety Plan".

After ceasing electroplating operations at PPDI, the plating solutions were pumped out into 55-gallons drums. Then, the sludges were removed and contained into 80-gallons salvage drums.

The following procedure has been used to decontaminated the tanks at PPDI. The tanks were washed with excess water, and neutralized/mothballed with a solution of 10% Hydrochloric Acid. An oil coating (W-40 type) was sprayed on tankwalls to preserve the tanks from corrosion. All filtering units, holding tanks and associated piping were also properly washed.

The equipment was finally sold to Dorado Electroplating, Inc.

All contaminated washwaters and rinses were discharged into the existing surface impoundments, after being neutralized.

After dismantling/removing the equipment, the floor was scraped. Areas where there is evidence of possible contamination were shovelled, and the resulting solid debris placed into drums for disposal at an EPA approved facility.

Uncontaminated construction scraps were disposed of at an approved municipal landfill.

The containers storage area was properly washed with excess water and reconditioned for the future, short term storage of spent trichloroethane and waste oil in drums.

### 8.0 SITE RECLAMATION

The area where the electroplating plant, pipelines and waste treatment plant were placed will be leveled and reconditioned for future manufacturing activities. The container storage area will be reconditioned to store spent solvents and waste oils for less than 90 days.

### 9.0 POST CLOSURE CARE

Since all wastes will be disposed offsite and no hazardous waste will be left on site for the storage and treatment facility, no post-closure activities or cost assignments for this facility will be required.

### 10.0 CERTIFICATION

After performing a thorough inspection of the concerned areas and revising available records on waste generation and management, a certification was signed attesting that the facility has been closed in accordance with this closure plan. The certification was signed by an independent registered professional engineer in Puerto Rico and by a PPDI authorized representative.



### Fernando L. Rodríguez, P. E. & Associates

Environmental Engineering Consultants

#### CERTIFICATION

I hereby certify that the closure of the hazardous waste storage and treatment facilities at Precision Protective Devices, Inc., located at Palmer, Puerto Rico was performed according to the applicable state and federal regulatory guidelines under their hazardous waste management programs.

I have inspected the facility and being familiar with the provisions of 40 CFR, Part 265, Subpart G, attest that the closure activities were performed in accordance with the specifications addressed in the closure plan submitted to the Environmental Quality Board.

Date: Ash. 17, 1854

Registration No. 6510

Seal:

RODRIGUETO CO STORE STOR

FERNANDO L. RODRIGUEZ OCASIO PRINTED NAME OF PROFESSIONAL ENGINEER

SIGNATURE OF PROFESSIONAL

ENGINEER

MR MANUEL M. SANCHEZ

PRESIDENT

NAME OF FACILITY AUTHORIZED

REPRESENTATIVE

SIGNATURE OF AUTHORIZED REPRESENTATIVE

### ALABAMA

## HAZARDOUS WASTE MANIFEST

CWMA Nº 81217

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### ALABAMA

### HAZARDOUS WASTE MANIFEST

CWMA Nº 81217

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### INTRODUCTION

Environmental Quality Board (EQB) personnel from the Field Sampling and Monitoring Division of the Water Quality Bureau (WQB) carried out a National Pollutant Discharge Elimination System (NPDES) permit compliance sampling inspection of the effluent from Precision Protective Devices, Inc. located in Palmer, Rio Grande, Puerto Rico.

The facility discharges its treated wastes to Quebrada Honduras and Río Mameyes, water bodies with a use classification of SD by Puerto Rico's Water Quality Standards Regulation (WQSR).

A plant compliance evaluation inspection was concurrently carried out by personnel from the Permits and Engineering Division of WOB.

The sampling inspection covered a period of twenty-four (24) consecutive hours during October 27-28, 1981. Samples were taken or the analysis of the following parameters: Total Suspended Solids (TSS), Chemical Oxygen Demand (COD), surfactants, color, turbidity, total dissolved solids (TDS), chlorides, nitrates + nitrites, total phosphorous, oil and grease, cadmium, zinc, copper, total chromium, hexavalent chromium, iron, silver, aluminum, nickel, tin and total and fecal coliforms. The following parameters were measured on site: temperature, pH, dissolved oxygen (DO), and flow. Chemical and bacteriological analysis of the samples were done by EQB's Laboratory Division.

Objective of the sampling inspection at the facility was to determine (1) effluent quality being discharged to the receiving waters and (2) effluent compliance with the NPDES permit limitations.

### BACKGROUND, SUMMARY AND CONCLUSIONS

Precision Protective Devices, Inc. with Standard Industrial Classification (SIC) code of 3471, is a subsidiary of the General Electric Company, engaged in electroplating of metal parts used in the manufacture of electrical switches and circuit breakers.

Wastewaters generated by Precision Protective Devices are treated as follows: Electroplating rinse waters are segregated into chromium or acid/alkaline streams. The chrome rinse water is subjected to chrome reduction and is then mixed with the acid/alkaline rinse water. This mixture is pH adjusted for optimum metals precipitation in settling lagoons. Any concentrated dumps of chrome or acid/alkaline are transferred to separate holding tanks where they are slowly bled to chrome reduction or pH adjustment. These treated waters are discharged through outfall 001. Wastewaters from discharge 002 consist of a combination of non-contact cooling waters from compressor and

molding, contact cooling water from welding, and storm water.

A first round NPDES permit was issued to Precision Proctective Devices (PPD) on August 24, 1974 becoming effective on Setember 30, 1974 and expiring on September 29, 1979.

On July 1, 1975 the permittee submitted a letter to the United States Environmental Protection Agency (EPA) requesting a revision of the NPDES permit in order to include new parameters involved in the plating facilities. A request for revision of the permit was also submitted on March 31, 1978 in order to include cyanide and chromate limitations since these two compounds were used in zinc and silver plating processes.

EPA issued a Finding of Violations and Order to Show Cause against the permittee for the discharge of cyanide and chromate from an unauthorized discharge that had been occuring since January 1978. A hearing was scheduled for September 14, 1978 at 10:30 am. On this date the permittee reported that they had ceased zinc cyanide and silver plating and the used of chromium in plating as of August 11, 1978 as recommended by EPA. Any further action taken by EPA concerning the unauthorized discharge is unknown to EQB.

A renewal application for a NPDES permit was submitted by Precision Protective Devices on October 30, 1978. Discharge 002, which was not included in the previous permit, was included in the permit renewal. A Water Quality Certificate (WQC) was requested by the permittee on February 3, 1979.

The regulatory 30 day public comment period was established with the issuance of the public notice on September 5, 1979 concerning the WQC draft and within this period, on September 20,1979 Precision Protective Devices requested a one month extension of the public notice/comment period, in order for Langston Laboratories to perform wastewater sampling and analyses which would serve to generate meaningfull and accurate comments regarding the draft permit and Precision Protective Devices, ability to comply. The time extension was granted and the permittee submitted comments on the draft permit on October 25, 1979. These were as follows:

- 1. Water quality standards should not be applied to the points of discharge.
- 2. In recognition of the need for a mixing zone to properly establish permit limits, the permittee requested information regarding the proper format for information to be submitted in accordance with Section 5.2 and 5.3 of the WQSR that deal with mixing zones.
- 3. Waste load allocations should be developed for each discharger whenever a receiving body of water is quality limiting.
- 4. Effluent limitations for nickel, copper, zinc, cadmium,

and silver be technology based.

- 5. Gross discharge limitations for discharge 002 be changed to net discharge limitations.
- 6. Draft NPDES permit contains several limitations that the permittee feels are not practically or economically achievable, in other words, no socioeconomic impact is considered.

On March 6, 1980 EQB responded to the pemittee with the following the comments:

- 1. Since the receiving body of water is a stream with relatively small physical dimensions, a mixing zone that meets the requirements of the WQSR cannot be granted.
- 2. In the absence of a mixing zone, EQB has two options: deny certification or certify water quality standards at the points of discharge. EQB opted for the second alternative which allows the facility to operate while compliance is achieved by meeting the standards.
- EQB did not penalize the company for pollution of the receiving body of water upstream from the point of discharge.
- 4. The certification process was established to assure that if technology based effluent limitations in draft NPDES permits are not sufficient to assure compliance with Puerto Rico's Water Quality Standards, then EQB through the WQC will indicate the more stringent limitations that should be imposed.
- 5. EQB agreed with the company's position on net effluent for discharge 002.
- 6. The certifying process does not provide for consideration of socioeconomic impact. Since EQB has not been delegated the NPDES, this matter should be taken up with EPA.

The second NPDES permit was issued on September 11, 1980 becoming effective on October 31, 1980 and expires on June 30, 1985.

A review of available DMR's submitted by Precision Protective Devices shows that the permittee has reported non-compliance with permit limitations in at least one occasion for cadmium, oil and grease, total iron, total aluminum, total disolved solids, total suspended solids, boron, and total tin.

Temperature, pH, color, zinc, nickel, copper, and silver limitations have been reported in noncompliance on serveral occasions. During 1979 temperature was violated on a continuous

basis.

The current permit for the facility requires that parameters be reported as net value, however, from November 1980 to May 1981 parameters were being reported as effluent gross limitations on the DMR forms submitted by the permittee. DMR's submitted during this period were evaluated on the basis of a compliance factor of 2 allowing for an allocation in the influent equivalent to the permit limitation for each pollutant. Any parameter with a compliance factor greater than 2 was considered out of compliance.

The Permits Division personnel has performed four (4) compliance evaluation inspections of wastewater treatment system of Precision Protective Devices. The first inspection was performed on August 8, 1978 and the following was reported:

- 1. Cyanide and chromate were present in the electroplating process and were not limited on the NPDES permit.
- 2. The facility had an unauthorized discharge which consisted of cooling waters.
- 3. There was no standby power available.
- 4. None of the treatment units were in service.
- 5. The calibration frequency of the primary measuring device was not adequate.
- 6. The sedimentation lagoons had never been cleaned.
  Officials of Precision Protective Devices indicated they did not know how to dispose of the sludge.

The second inspection was performed on December 6, 1979, it was reported that (1) there was an unauthorized cooling water discharge, and (2) the impeller type flow measuring device was out of service due to solids obstruction at the impeller causing and improper flow measurement.

On the third inspection, performed on May 18, 1981 it was reported that:

- The primary flow measuring device was not properly maintained or operated.
- 2. The permittee did not have a primary flow measuring device for discharge 002.
- 3. The weir at dischrge 001 was located near the river edge, and when the river flow increased the weir flooded.

The fourth compliance evaluation inspection was performed concurrently with the 24 hour sampling inspection on October 27, 1981. During this fourth inspection personnel from the Permits

Division found the following:

- 1. Sludges and solids generated from the water treatment were not properly disposed of.
- 2. The flow measurement equipment was not adequate to handle expected ranges of flow rates.
- 3. The primary flow measuring device for discharge 002 was flooded and out of calibration.
- 4. The day of the sampling inspection the permittee took an automatic composite sample that was not in accordance with the method of collection for such samples.
- 5. Sedimentation lagoons were full of grass and sludge. The facility representative informed that the lagoons had not been cleaned or maintained during the last eight (8) years.

A previous sampling inspection performed on June 30, 1977 by the Field Sampling and Monitoring Division revealed that the permittee has violated the Federal Water Pollution Control Act Amendments (FWPCAA) of 1972, Sections 301 and 307 (a).

The twenty-four (24) hour sampling inspection carried out by EQB personnel during October 27-28, 1981 revealed the following: The effluent at station 001 exceeded permit limitations for nickel by a compliance factor of 2.24, and tin by a compliance factor of 4.61.

Water Quality Standards for dissolved oxygen, boron, copper, color, total dissolved solids, surfactants, and total coliforms were violated at Station 001. Water Quality Standards for silver, and total and fecal coliforms were violated at Station 002. Flow from station 003 (relief valve at fire pump) violated the Water Quality Standards for zinc and silver. In addition this is an unauthorized discharge that should be eliminated by the permittee.

COD and total phosphorous at station CO1, aluminum and tin at station CO2, and iron, aluminum, and tin at station CO3, were found in high concentrations; however, there are no applicable water quality standards for these parameters.

### RECOMMENDATIONS

It is recommended that the permittee (1) dispose adequately of the sludge generated in the treatment plant, (2) modify flow measuring equipment in order to handle adequate ranges of flow, (3) install measuring devices at accessible sites in order to obtain accurate readings of flow, (4) improve sampling techniques, (5) properly maintain and operate primary flow measuring devices, and (6) inform EQB and EPA of any by-passing

Table 1: Field Measurements of Grab Samples and Analytical Results of Composite Samples From the Effluent of Precision Protective Devices, Inc. Compared to the NPDES Permit Limitation and to Puerto Rico's WQSR for SD Waters.

		Analytical Reslts								
O : C	Temp. °C (°F)	pH SU	DO * mg/l *	TSS mg/l (kg/day)	COD mg/l	Surf. mg/l	Cd mg/l	Zn mg/l (kg/day)	Cu mg/l	Total Cr mg/l
NPDES Limitations Station 001	. N/L	6.0-9.0	N/L *	(12.4) max.	N/L ·	N/L	1.0 . max.	(0.207) max.	1.0 max.	1.0 max.
Station 001	25.0-26.5	6.3-6.8	1.2-2.5 *	14 (7.2)	24.06	0.280	0.002	1.14 (0.596)	0.073	0.000
Net Values 001	· N/D	N/D	N/D *	(a)	14.76	0.23.	0.0019	(a)·	0.069	0.0
NPDES Limitations Station 002	34.5 (94) max.	6.0-9.0	%/L * %	40 max;	N/L	N/L	N/L	N/L	N/L	N/L
Station 002	26.0-32.0	6.3-7.7	6.8-8.0 🤻	14	5.85	0.070	0.0007	0.03.	0.014	0.000
Net Values 002	N/D	N/D	. N/D *	<b>-</b> 6	-3.45	0.02	0.0006	-0.10	0.010.	0.0
Station 003	-	2	* - *		<del></del>	-	0.0003	0.07	0.018	0.0002
Influent	23.0-26.5	6.4-7.6	7.0-8.5	22	9.30	0.050	0.0001	0.13	0.004	0.000
WOSR	34-5(94)	6.0-9.0	5.0 * MIN. *	11/5	N/S	0.10	0.005	0.05	0.04	0.10

Table 1: Analytical Results of Composite Samples (Cont.)

### Analitycal Results

	B mg/l	Fe mg/l	Ag mg/l (kg/day)	Al mg/l	Ni mg/l	Sn mg/l
NPDES Limitations Station 001	N/L	1.5 MAX.	(0.070) MAX.	1.2 MAX.	1.0 MAX.	2.0 MAX.
Station 001	2.43	0.474	0.569 (0.292)	0.407	2.25	12.77
Net Values 001	2.334	0.20≒	(a)	-2.03	2.24	9.23
NPDES Limitations Station 002	1.0 max.	2.5 max.	N/L	N/L	N/L	N/L
Station 002	0.085	0.460	0.026	2.88	0.011	4.63
Net Values 002	0.039	0.19	-0.132	0.39	0.003	1.09
Station 003		16.36	0.117	14.45	. 0.00	3.30
Influent	0.046	0.279	0.158 .	2.49	0.008	3.54
WQSR	1.0	N/S	0.001	n/s	N/S	N/S

N/D = Not determined
N/L = Not limited
N/S = No standard
Min = Minimum

Max. = Daily Maximum - = Not analyzed

<sup>(</sup>a) = Influent wasteload for TSS, Zn and Ag cannot be calculated because influent flow was anot measured, hence a determination of compliance with net wasteload limitation for TSS, Zn and Ag cannot be made.

# FIGURE 1: LOCATION MAP

INDUSTRIAL .SITE AM DIO CHAROT COUNCIS CANTRAL OIGHAS בש בשוני בש בשני בשני בשני ב LOCATION MAP PPDI & CBI SITE PLAN OCTOBER 11, 1978 DISCHERGE

REFERENCE 4



### SOLID WASTE MANAGEMENT UNITS CLEAN-UP WORK PLAN

## CARIBE GENERAL ELECTRIC PRODUCTS, INC. PALMER, PUERTO RICO

EPA I.D. NO. PRD090510793

Prepared by:

Law Environmental, Inc. 112 TownPark Drive Kennesaw, Georgia 30144

JUNE, 1989

### 1.0 INTRODUCTION

A RCRA Facility Assessment (RFA) of the Caribe General Electric Products, Inc., Palmer Plant (GE-Palmer) was conducted by Science Applications International Corporation under contract to U.S. EPA Region II. The RFA was reported to the Agency on August 4, 1986. The RFA report identified nine Solid Waste Management Units (SWMUs) at GE-Palmer.

At an EPA/GE-Palmer meeting held on August 24, 1988, at U.S. EPA Region II (Agency) offices in New York, the Agency suggested that GE-Palmer consider implementing appropriate clean-up activities for the SWMUs during mobilization for closure of the RCRA regulated surface impoundments. It is the intention of GE-Palmer to proceed with this concept.

The purpose of this SWMU Clean-Up Work Plan is to evaluate the RFA information and other related data to assess whether clean-up of the SWMUs identified at the site is necessary. The plan summarizes the proposed clean-up activities for the SWMUs believed to present a potential for release of wastes to the environment. These activities will be performed concurrently with closure of the RCRA surface impoundments.

### 2.0 SITE DESCRIPTION

GE-Palmer is a wholly owned subsidiary of General Electric Company. The facility is located on Road 191, KM 0.8 Palmer, Municipality of Rio Grande, Puerto Rico (Figure 1). The GE-Palmer manufacturing facility consists of two buildings that are located west of the Mameyes River (Figure 2). The General Electric site is bordered to the north and west by Honduras Creek, to the east by the Mameyes River, and to the south by Puerto Rico Industrial Development Company (PRIDCO) land. The parcel is divided in a north-south direction by Road 191.

### 3.0 DESCRIPTION OF SOLID WASTE MANAGEMENT UNITS

The individual SWMUs identified in the RFA report are listed in Table 1, along with a brief facility description and operational history. The locations of these units, as indicated in the RFA report, are shown on Figure 2. The following presents a brief description of each SWMU identified:

### 3.1 Surface Impoundments

The RCRA regulated surface impoundments were identified in the RFA as SWMU 1. In the impoundments, metal hydroxides settled out as sludge. The supernatant was gravity discharged to the Mameyes River under NPDES regulations. These impoundments are scheduled for closure during 1989 following the approval of the Closure and Post-Closure document Plan by EPA/EQB.

### 3.2 Collection Sumps

The former electroplating operation at GE-Palmer included a wastewater treatment system to perform basic operations such as cyanide destruction, chromate reduction, and

pH adjustment. The untreated effluent from the plating tanks was collected in a sump (SWMU 4) and pumped into the wastewater treatment tanks adjacent to the plating room.

The treated effluent was then discharged to the impoundments through an underground pipe that traversed the parking lot and Road 191. The pipe appears to be 4-in. diameter vitrified clay. Wastewater discharge from the former treatment area through the impoundments to the Mameyes River was gravity driven, opposed to pumping as indicated in the RFA. The Parking Lot Sump (SWMU 3) and the Pump House Area Sump (SWMU 2) were part of the system conveying treated effluent from the wastewater treatment tanks into the impoundments.

It is believed that once the plating process was discontinued, some solids in suspension (F006 waste) could have settled in the three aforementioned sumps. Information provided by Mr. Angel Arroyo from GE-Palmer indicated that the sumps were not cleaned when the plating operation was terminated in 1981.

### 3.3 Septic Tanks

The septic tanks at GE-Palmer were identified in the RFA as SWMU 5. The septic system, consisting of two septic tanks (one for each building), was built in the 1940's by PRIDCO, the former owner of the GE-Palmer buildings. This SWMU Clean-up Work Plan designates the septic tank for Building 1 as SWMU 5A and the septic tank for Building 2 as SWMU 5B. The location of the septic tanks is shown in Figure 2.

Construction drawings of the GE-Palmer site are scarce due to the age of the buildings. Eng. Mario Soto of PRIDCO indicated in a telephone conversation that the Government agency disposed of the drawings when the facilities were sold to GE. At the Plant, only two drawings related to the septic system were found. The "Access Road and Plant Profile" is included as Figure 3. The profile shows one septic tank location relative to Building 1. Approximate horizontal dimensions are 40 ft. long by 8-ft. wide. The difference between the top and invert elevations indicate that the septic tank is about 6-ft. deep.

The "Fresh Water and Sanitary Layout" included as Figure 4 shows piping connections to the sanitary sewer (septic tank) systems. This drawing indicates that the only facilities connected to the septic tanks are the bathrooms and the floor drains inside the bathrooms. The drawing shows no other drains inside the plant building. The letters D.F. in the drawing stands for the building "drinking fountains" connected to the "drainage". Mr. Antonio Diaz, maintenance supervisor with GE-Palmer identified this drainage as the storm water collection system.

Table 2 shows the sediment sampling results of the RFA and the split sampling activity performed by Law Environmental Services (LAW) concurrently with the RFA sampling. The septic tank sample (ST-3) does not show significant concentrations of the constituents analyzed. The RFA report indicated that TOX levels are three times higher than background, Cadmium was twice as high, and Zinc was three times as high as background. However, the concentration numbers for the constituents of concern in the local background shown in Table 2 and referenced by the RFA are not directly

applicable to the septic tank sample. The "background" sample was obtained from sediments of the Mameyes River. A copy of the LAW report for the split sampling activity is included in Appendix A.

The information presented above indicates that the septic tanks were designed for sanitary wastes. There is no indication that the septic tanks have received hazardous wastes. Therefore, we believe that the septic tanks should be eliminated from the SWMU list and no clean-up activities are proposed.

#### 3.4 Lagoon Waste Pile

The Lagoon Waste Pile identified in the RFA as SWMU 6 may have resulted from past waste handling activities. The area where the sludge was potentially placed is shown in Figure 2.

The RFA report indicates that "the May 1986 site inspection did not reveal any visible evidence of those waste piles" (RFA, page 10). The RFA also indicates that, in general, metal concentrations "showed a strong trend in which levels are higher in the upper reaches of the soil column" (RFA, page 37).

Law Environmental Services performed soil sampling and analyses in the area of the alleged pile and reported the results to GE-Palmer in January 23, 1985. The report entitled "Soil Sampling and Analysis Adjacent to Lagoons" was submitted to the EPA in 1985 as part of the original Closure, Post-Closure Plan document for the surface impoundments. A copy of this report is included in Appendix B. The Law Environmental Services report concluded that "no direct visual evidence of sludge was noted in the soil samples retrieved from the area between the lagoons and the Rio

Mameyes. Results of the EP-Toxicity analysis found the soil samples to be non-toxic."

The soil sampling results included on Table 3 show concentrations of metallic constituents of concern at about the same levels as background samples. Although Nickel concentrations exceed background, the levels are below the published EPA RFI action levels (340 mg/kg). We believe that there is no conclusive data to indicate that a SWMU exists in the area identified in the RFA and therefore, it should be eliminated from the SWMU list. However, the area of this "SWMU" is included in the construction area for the impoundments closure and will likely be affected by the closure operations. Because the Closure and Post-Closure Plan Document includes procedures to test for contamination in working areas, no additional activities are envisioned besides those proposed in the Closure Plan.

#### 3.5 Parking Lot Waste Pile

The location of the Parking Lot Waste Pile (SWMU 7) is shown on Figure 2. There is no known knowledge at GE-Palmer that this pile ever existed. We believe that the RFA authors misinterpreted Figure 1 of the January 29, 1985, report entitled "Sampling and Analysis of Soils in Plant Area." A copy of this report is included in Appendix C. Figure 1 of the report presents this area as a sampling area and not as a disposal area.

This is better explained in Figure 2 of the subject report. It shows that the second sampling activity at the edge of the southern portion of the parking lot occurred at the surface runoff ditch. The rationale for sampling in that area was the concern of GE-Palmer that surface runoff potentially contaminated with waste from the Drum Storage Area may have contaminated soils near the drainage ditch. The report concluded that

"adjacent ditch locations are non-toxic."

The soil sampling results for the Parking Lot Waste Pile included in Figure 3 (samples PL-1 through PL-4) show that the concentrations for the constituents of concern are within the range of background levels as recorded by the RFA and Law. Figure 4 of the RFA report show the sampling locations for the parking lot waste pile in the drainage system path. Therefore, it appears that the RFA investigators were addressing only one SWMU (the drainage system), and not an additional one as the parking lot. It is believed that the Parking Lot Waste Pile is non-existent and should be eliminated from the SWMU list. No additional activities are proposed.

#### 3.6 Drum Storage Area Waste Pile

The Drum Storage Area Waste Pile was identified in the RFA as SWMU 8. GE-Palmer has indicated that approximately 200 pounds of F006 sludge were located behind the drum storage area waiting for disposal. The area where the waste was potentially placed is shown in Figure 2.

Law Environmental Services performed soil sampling and analysis in August, 1984, in the area where allegedly 200 lbs of sludge were left. A copy of the resulting report dated January 29, 1985, is included in Appendix C. The Law Environmental Services report concludes that soils in the vicinity of the drum storage area were non-hazardous.

Table 3 shows the results of RFA soil sampling of the drum storage area waste pile and the split sampling activity performed by Law concurrently with the RFA sampling.

Organic constituents are within background levels. The RFA reported that the

concentrations of cadmium, nickel and zinc found at the "waste pile" area are higher than background. However, Table 3 shows that metal concentrations are within the range of concentrations found throughout the site. The investigators appear to acknowledge the constituent variability of the area by reporting that "the difference in the results may indicate a non-homogeneous distribution of hazardous constituents in the soils (RFA, page 41)." Note that the RFA inspection did not reveal any visible evidence of this waste pile and only one sample (DP-1) was found with a concentration of nickel above its respective action level.

Based on the above discussion, it is believed that the drum storage area waste pile should be eliminated from the SWMU list. The additional background sampling proposed in the sampling and analysis procedures (Appendix D) will help assess the site conditions and will establish the basis for data comparison. This activity will comply with the intentions of the RFA recommendations. No additional activities are proposed for this area.

## 3.7 Run-off Collection System

The RFA identifies the storm water runoff collection system as SWMU 9. This system consists of a concrete channel about two feet wide and one foot deep and a section that borders Building 2, consisting of a half concrete pipe (about 12 inches in diameter). This system borders the site and collects run-off from plant areas. The unlined section of the system south of the parking area has been recently lined following the design of the concrete channel as part of normal site improvements. The surface water runoff collected in the channel is currently discharged to the Mameyes River and Honduras Creek under NPDES Permit No. PR0000671. This permit requires surface runoff

sampling and analysis after rain events in areas where mixing with process waters does not occur.

The process discharge stream includes cooling water, washing wastewaters, and sand filter backwash. The cooling water and washing wastewaters discharge into the drainage system and are monitored according to the schedule included in the NPDES Permit. This SWMU Clean-Up Work Plan designates the section of the system consisting of a concrete half pipe and discharging into Honduras Creek as SWMU 9B and the section of the system consisting of a concrete half pipe and discharging into the Mameyes River as SWMU 9A.

#### 4.0 PROPOSED CLEAN-UP ACTIVITIES

## 4.1 Surface Impoundments (SWMU 1)

Clean-up activities associated with the RCRA regulated surface impoundments are described in the Closure and Post-Closure Plan document currently under review by EPA and EQB. No additional activities are anticipated for these units beside those already proposed.

### 4.2 Wastewater Discharge Sumps (SWMUs 2, 3, and 4)

The sumps were identified in the RFA as: 1) Pump House Area Sump, 2) Parking Lot Sump, and 3) Electroplating Area Sump. Clean-up of the section of pipe from the pump house area sump to the impoundments was addressed in the Closure and Post-Closure Plan for the surface impoundments.

The proposed clean-up activities for those units are as follows. Supernatant and sludge,

#### TABLE 1

# SOLID WASTE MANAGEMENT UNITS (SWMUS) OPERATIONAL HISTORIES AND FUNCTIONS CARIBE GENERAL ELECTRIC PRODUCTS, INC. PALMER, PUERTO RICO

RFA SWMU UNIT NO.	DESCRIPTION	OPERATIONAL DATES	FUNCTION
. 1	SURFACE IMPOUNDMENTS (RCRA UNITS)	1956-1981	This unit includes two unlined surface impoundments of about 80 feet wide and 270 feet long. They allowed settlement of suspended solids, primarily metal hydroxides (F006), from electroplating waste treatment operations.
2	PUMP HOUSE AREA SUMP	1956-1981	This unit was part of the transfer pipeline from the wastewater treatment system to the surface impoundments. Located in the eastern portion of the GE-Palmer site, it is believed to have been used as a pipe cleaning manhole.
3	PARKING LOT SUMP	1956-1981	This unit served the same purpose as SWMU 2 above. It is located in the west side of Road 191.
4	ELECTROPLATING AREA SUMP	1956-1981	This unit was part of the transfer pipeline from the electroplating area to the wastewater treatment system. It is believed to function as a gravity collection sump.
5	SEPTIC TANKS	1956-Present	Septic Tank Nos. 1 and 2 are used for sanitary sewage collection from Building No. 1. The tank named CBI is used for the same purpose at Building No. 2. They are believed to be constructed of concrete block walls with dimensions of approximmately 20 ft. long by 18 ft. wide by 8 ft. deep.
6	LAGOON WASTE PILE	Unknown -	Unconfirmed information indicates that dredged sludge from impoundment cleaning operations may have been deposited for draining prior to disposal.
7	PARKING LOT WASTE PILE	Unknown	Unknown; we have no information about the existence of this SWMU.
8	DRUM STORAGE AREA WASTE PILE	Unknown - Estimated between 1972 - 1974	About 200 lbs. of F006 sludge were placed in the area behind the Drum Storage Shed.
9	CONCRETE DRAINAGE SYSTEM	1956 - Present	This unit consists of a series of concrete lined trenches about 3 ft. wide by 1 ft. deep designed to catch storm water runoff. SWMU 9A directs runoff to the Mameyes River while SWMU 9B directs runoff to Honduras Creek. A section of the system south of the Parking tot is unlined.

TABLE 2
SEDIMENT SAMPLING RESULTS
(JUNE 24-25, 1986)

LOCATION/CONSTITUENT		ox pm)	(pp		CHRO	MIUM pm)		MIUM pm)	LE.	AD pm)	NI(	CKEL om)		NC ppm)		NOLS pm)	p (un	H its)		NIDE /kg)
	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW
LOCAL BACKGROUND	ł		1		1		1				1				ſ	•	1		[	
RMR-6	<3.0	N/A	742 	N/A	42 	62	5 	<2	<50 	<10	26.8	32	61.8	52	N/A	N/A	6.4	N/A	N/A	N/A
CONCRETE DRAINAGE	   		 		 		 				   		 		 		 		 	
SYSTEM	j -		<u>.</u>		į :		i						i		i		, 		i	
CDS-1	103	N/A	18840	N/A	55	N/A	15	N/A	322	N/A	396	N/A	884	N/A	2.74	N/A	6.7	N/A	N/A	N/A
CDS-5	150	N/A	36000	N/A	88	N/A	24	N/A	290	N/A	1803	N/A	910	N/A	2.26	N/A	6.7	N/A	N/A	N/A
CDS-2	334	N/A	18100	N/A	- 53	N/A	7	N/A	155	N/A	29.4	N/A	552	~N/A	0.26	N/A	7.4	N/A	N/A	N/A
CDS-3	172 	N/A	38490 	N/A	182 	N/A	21  -	N/A	1101	N/A	69.6	N/Ą	829 	N/A	0.66	N/A	7.2	N/A	N/A   	N/A
MAMEYES RIVER	 			•	i I		 				;   		 		 	÷	   	•	 	
RMR-4 (Downstream)	j 4	N/A	N/A	N/A	22	N/A	<5	N/A	<b>&lt;50</b>	N/A	14	N/A	42.7	N/A	N/A	N/A	6.2	N/A	N/A	N/A
RMR-5 (Outfall)	23.5	N/A	4080	N/A	   29 	41	5	<2	<34	<10	42.8	88	101	330	N/A	N/A	6.5	N/A	N/A	N/A
ELECTROPLATING AREA		-	 !		;   		 		İ				 		 		 		,   	
EP-1	284 	N/A	N/A	N/A	259	N/A	'   42 	N/A	307	N/A	10200	N/A	7180	N/A	   N/A 	N/A	7.7	N/A	   N/A	N/A
PUMP HOUSE SUMP			 	,	 		!   				   		1		!   		;   		,   	
PHS-2	186	N/A	   N/A	N/A	191	N/A	   109 	N/A	127	N/A	7360	, N/A	6072	N/A	I N/A	N/A	   6.9	N/A	   N/A	N/A
SARKING LOT CIMB			! 		 		   										   	×	 	
PARKING LOT SUMP	1 157		   12070		1 70	/00	   .e	71	.50	240	7474		1 020/	F / 000						.0.5
PLS-2	153	N/A	12830	27000	39	480	<5 	36 .	<50	260	3131	45000	8284	56000	N/A	N/A	12	N/A	N/A	<0.5
SEPTIC TANK	1	•	 				[ 	, j				•								
ST-3	11.6	N/A	N/A	N/A	8	N/A	11	N/A	<51	N/A	12.5	N/A	204	N/A	N/A	N/A	6.8	N/A	N/A	N/A

TABLE 3
SOIL SAMPLING RESULTS
(JUNE 24-25, 1986)

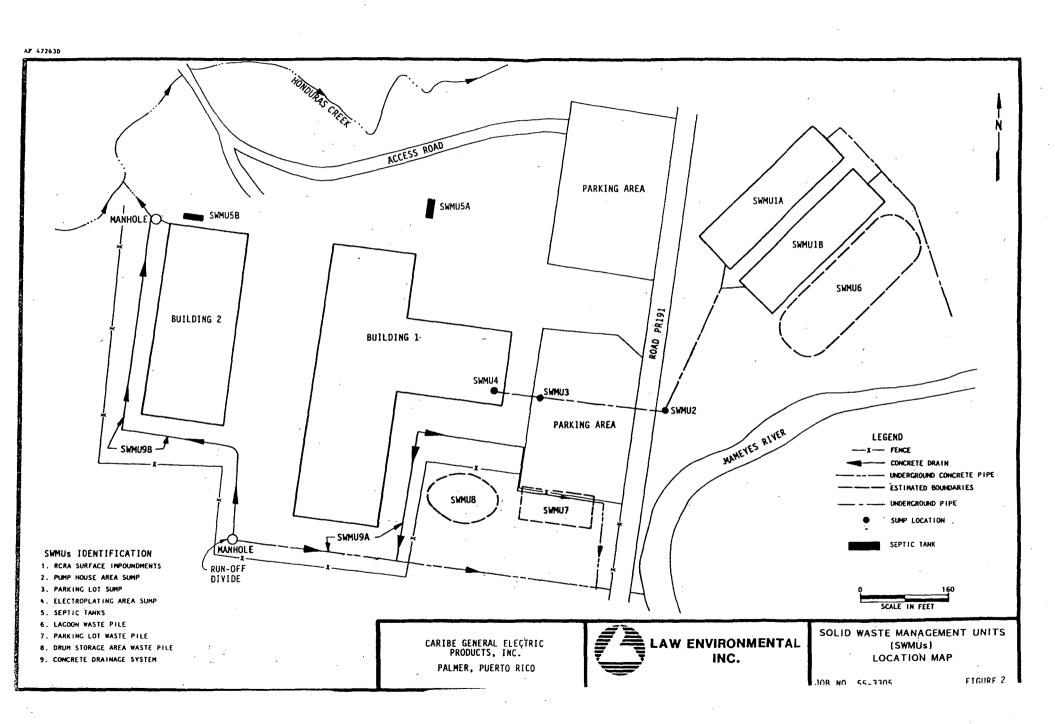
LOCATION/CONSTITUENT		OX pm)	то (pp		CHR(	OMIUM Om)		MIUM pm)		AD pm)		CKEL om)	ZII (pr		p (un	H its)		NIDE /kg)	
,	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	RFA	LAW	
LOCAL BACKGROUND	!		i			.	-						l				l	ı	ĺ
BG-1 (0-1 ft)	<3.0	N/A	18790	12000	43	.67	11	9.5	90	130	23.7	24	96.3	60	7.9	7.9	N/A	<0.5	l
BG-2 (1-2 ft)	<3.0	N/A	5630	N/A	62	100	8	2	330	2000	27.4	38	96.8	71	7.7	8	N/A	<0.5	ı
-	l									-					1		1	[	į
	j		1			1												İ	
LAGOON WASTE PILE	1			İ	1	-					(		Į		1		1		ı
LP-1 (0-1 ft)	5.1	4.8	16270	13000	42	95	131	170	<49	<10	135	170	142	270	5.7	6.5	N/A	2.5	į
LP-2 (1-2 ft)	<3.0	N/A	8720	11000	39	70 -	. 8	8.9	<49	<10	31.7	38	71.9	89	5.3	6	N/A	<0.5	ĺ
LP-3 (0-1 ft)	<3.0	N/A	13590	N/A	39	80	28	31	<51	<10	88.5	120	125	160	5.4	6.3	N/A	0.62	ĺ
LP-4 (1-2 ft)	9	N/A	10620	N/A	39	58	9	7.3	<46	<10	33.1	46	74.7	90	5.3	6.4	N/A	<0.5	į
LP-5 (0-1 ft)	<3.0	N/A	14090	N/A	40	50	8	4	<50	200	34.1	64	77.1	100	5.1	5.9	N/A	<0.5	ĺ
LP-6 (1-2 ft)	<3.0	N/A	9090	N/A	16	67	<b>&lt;</b> 5	3	<49	<10	13.7	51	41.6	110	5.2	6.2	N/A	<0.5	į
			1			1									l		1	i	ļ
	1				[					!							1	l	j
PARKING LOT WASTE PILE			1			l				1								i	ŀ
PL-1 (0-1 ft)	<3.0	N/A	7900	N/A	46	85	10	2	<49	<10	123	72	86.4	69	5.9	7	N/A	<0.5	j
PL-2 (1-2 ft)	<3.0	N/A	8550	N/A	74	100	11	2	<48	<10	58.8	40	49.1	65	7.3	8	N/A	<0.5	j
PL-3 (0-1 ft)	<3.0	N/A	31070	N/A	50	39	10	<2	<50	<10	51.2	26	67.4	N/A	6.9	7.7	N/A	<0.5	ļ
PL-4 (1-2 ft)	<3.0	N/A	20040	14000	57	74	8	<2	<46	<10	28.3	54	54.6	54	7.1	7.9	N/A	<0.5	į
	1					1									1		1	ļ	ĺ
	1					Į				1					1		1	l	l
DRUM STORAGE WASTE PILE	İ		1														!	1	ı
DP-1 (0-1 ft)	<3.0	N/A	8370	14000	34	. 57	44	60	<48	<10	761	660	396	350	6.8	7.8	N/A	1.4	
DP-2 (1-2 ft)	<3.0	N/A	7100	N/A	49	83	8	6	<48	<10	64	89	66.3	<i>7</i> 3	6.9	7.9	N/A	0.3	ı
DP-3 (0-1 ft)	<3.0	5.2	12780	N/A	41	94	20	23	208	280	266	330	152	240	6.8	7.8	N/A	<0.5	j
DP-4 (1-2 ft)	<3.0	<0.1	7090	N/A	43	98	24	7.1	<45	<10	560	210	239	140	6.7	7.5	N/A	<0.5	
DP-5 (Dup of DP-4)	<3.0	N/A	8690	N/A	61	N/A	8	N/A	<48	N/A	69.1	N/A	66.8	N/A	6.8	N/A	N/A	N/A	i

#### TABLE 4

## CONSTITUENTS OF CONCERN (PARTIAL LIST)

Chromium Cadmium Lead Nickel Zinc Copper Phenols Sulphate Toluene Arsenic Barium Mercury Selevium Silver Tin Sulfide

Cyanide
Iron
Manganese
Sodium
Ammonia
Total Nitrogen
Oil & Grease
Phosphorus
pH
Chloride
Potassium
Aluminum
Magnesium
Calcium



REFERENCE 5

## Caribe General Electric Palmer Comprehensive Monitoring Evaluation PRD090510793

On May 5, 1987 a Comprehensive Monitoring Evaluation was performed at Caribe G.E. Palmer. On May 19, and 20, the sampling of four of the RCRA wells was performed as per the Sampling Plan already submitted. The report will be outlined as per the RCRA Ground-hater Technical Enforcement Guidance Document which are:

- A. Characterization of Site Hydrogeology
- B. Placement of Detection Monitoring
- C. Monitoring Well Design and Construction
- D. Sampling and Analysis Plan
- E. Detection Monitoring Data
- F. Assessment Monitoring

The Caribe G.E. Palmer lagoons has been in use since 1956. Their main use was to receive waste waters from the electroplating operations, for settlement of the particulate phase. The water on top used to be discharged under NPDES permit (D001 discharge point) to Mameyes River. The monitoring of discharge point D001 was discontinued on 1983. On 1983 a sampling was done by EQB's water Quality Program and was found an illegal discharge point at the lagoons caused by an overflow of the lagoons. In this illegal discharge Ag, Cu, and Zn parameters violated the Drinking Water Standard.

The company submitted a Closure Plan for the lagcons and is under evaluation by the Regulatory Agencies. Several attempts have been made to determine the volume of sludge present in the lagoons. During past management practices at G.E. Palmer, the sludge was removed and disposed at, at least, two different locations within G.E. Palmer property line. The sites has been under study by G.E. consultants.

## A. Cnaracterization of Site Hydrogeology

Two studies has been performed by Law Engineering. The first was done by the latter part of 1981 and the second was done by the latter part of 1984. On the first study, four wells were installed (U-1 as upgradient, D-1, D-2 and D-3 as downgradient). On the second study three additional wells were installed (M-4, as upgradient, and wells M-5 and M-6 as downgradient).

Both studies lack characterization of aquifer thickness, determining aquifer characteristics such as permeability, hydraulic conductivity and so on. No slug or pump tests were attempted to be made. Besides, vertical gradient or flow of ground water at the site has not been determined. Lack of determining confining layer of the uppermost aquifer is also noted.

No studies on waste characteristics and it's behavior on the hydrogeologic regime in order to determine the proper screen length and screen location on the ground water profile has not been made.

In addition to this, the horizontal movement of the ground water has been characterized showing two main ground water flow patterns, one converging on the lagoons and one diverging from the lagoons (see diagrams). Probably this is associated with different river stages throughout the year. The influence of the river stage on the lagoons must be addressed in order to properly determine water table and flow fluctuation in order to establish if the monitoring system is appropriate. This must be correlated also with the amount of rainfall in the area, therefore is recommended a gaging station. For details see Appendix A-1.

### B. Placement of Detection Monitoring Wells

Is important to note that the monitoring system was installed 25 years after the lagoons started to be used. The location of the monitoring wells is acceptable except for the U-1 well which turned out to be a downgradient well instead of an upgradient well as it was originally thought.

The wells are good for determining any degradation on the ground water only in the upper-portion of the aquifer, but if waste migrates, due to vertical flow component on the ground water, below the well screen, it would never be detected. See Appendix A-2 for details.

## C. Monitoring Well Design and Construction

The design of the RCRA monitoring wells is adequate although the construction procedures are suspected not to have been the adequate ones because filtered river water was used as drilling fluid and to clean the drilling equipment. Is not specified if samples were taken during drilling activities. Besides that, when air rotary drilling was used was not specified if the air was filtered or not. Although protective casings were placed in all wells, some of them do not work properly.

## E. Presenting Detection Monitoring Data

Chemical data has been on a tabulated manner, both quarterly and annually. The first year Primary Drinking Water Standards (PDWS) metal samples were not accepted because samples were not filtered, therefore, the background data was reestablished during the second year of monitoring. During every sampling at well D-2, the Cadmium concentration exceeded the P.D.W.S. limit. Since then all sampling events have showed the same behavior in that well. The company attribute it to past leakage of the discharge line to the river. There might be contamination due to waste migration from the unit because the unit has not received was for several years. See Appendix A-5 for details.

#### F. Assessment Monitoring

The company is actually under Detection Monitoring. After the first year of monitoring, Law Environmental Services sampled the wells for the semi-annual sampling. The sampling results showed triggering on several indicator parameters such as, pH, Specific Conductance (S.C.), and TOX. General Electric instate an Assessment Monitoring Program. On the resampling, they argue that the S.C. and the TOX triggerings were false positives. On the second semi-annual sampling pH and S.C. triggerings were also noted. To all this three sampling events, L.E.S applied a statistical method explained in a memorandum by John Skinner from EPA, regarding statistical method applied for indicator parameters. When applying this method, according to L.E.S. the triggering of all three sampling data sets and indicator parameters were false positives, therefore they reinstate the Detection Monitoring Program.

The process of determining the deleate of a value as reportable for triggering t-test is not quite clear. For example, after evaluating the 1st. semi annual chemical data and comparing it with the background statistical data it showed pH triggering at a significance of .999 level. After applying the method suggested by Mr. Skinner, the level of significance change to .95 or .975, then, L.E.S. states that the triggering was due to a false positive. Is not clear how different is a level of significance of .999 to be reportable from a .975 for not being reportable as triggering therefore inducing the company to instate an Assessment Monitoring Program.

REFERENCE 6



## LAW ENVIRONMENTAL SERVICES DIVISION OF LAW ENGINEERING TESTING COMPANY

2749 DELK ROAD, S.E. MARIETTA, GEORGIA 30067 (404) 952-9005

September 5, 1986

Caribe General Electric Products, Inc. P. O. Box 377
Palmer, Puerto Rico 00921

Attention: Mr. Angel Arroyo,

Plant Engineer

Subject: Special Sampling Conducted by the US EPA at the

Caribe General Electric Products Facility in

Palmer, Puerto Rico

Law Environmental Services Job No. WM3305

Dear Mr. Arroyo:

On June 24 and 25, 1986, Law Environmental Services (LES) was present at the Caribe General Electric Products (CGEP) plant to observe the sampling activities of the US EPA personnel and receive select split samples from them. LES was to analyze the split samples for certain key parameters in our laboratory in Marietta as a check of EPA's analytical technique. Attached to this letter are the LES laboratory reports containing our results for the analyses of the 26 split samples received from the EPA and the blank water used by the EPA personnel to rinse their sampling equipment.

The split samples were collected at several locations at and near the CGEP facility. The following is a list of these areas with the Station ID Number used by the US EPA and the LES Chemistry Laboratory.

<u>Area</u>	<u>Station</u>	<u>Matrix</u>
Background	BG	Soil
Mameyes River	RMR	Water/Sediment
Surface Impoundments	1 (LA or LB)	Water
Lagoon Waste Pile	2 (LP)	Soil

Page two Mr. Arroyo September 5, 1986

Area	<u>Station</u>	<u>Matrix</u>				
Parking Lot Sump	6 (PLS)	Water/Sediment				
Drum Storage Area Waste Pile	9 (DP)	Soil				
Parking Lot Waste Pile	10 (PL)	Soil				
Pump House Area Sump	13 (PHS)	Water				

The general locations of these sampling stations are indicated on a plan map of the facility in Figure 1.

Higher than background concentrations of certain metals were found at two areas. The shallow soil samples from the Lagoon Waste Pile and the Drum Storage Area Waste Pile locations contained greater amounts of cadmium, lead, nickel, and zinc than did the deep samples from the same respective locations.

The analytical results for the remainder of the samples tested by LES appear to be within the expected range for background conditions. Contamination appeared to be absent from all the other soil samples and the river sediment and water samples. High concentrations of metals were detected in the samples collected from the sumps.

Several of the soil and sump sediment samples contained enough total heavy metals (mainly cadmium) that there is a possibility that these materials could be defined by the agency as "hazardous" according to the toxicity characteristic. This could occur if most or all of any total heavy metal were able to leach from the materials under the conditions of the SW-846 extraction procedures for determining hazardous wastes. We believe that heavy metal leaching of the magnitude necessary to exceed the limits in SW-846 is unlikely to occur. In any case, the toxicity characteristic was not one of the tests to be conducted by the EPA, and LES did not perform this test.



Page three Mr. Arroyo September 5, 1986

If you wish, when the EPA completes their analyses we will review their results with you. If you have any questions about our results, please contact either of us at your convenience.

Yours Truly,

LAW ENVIRONMENTAL SERVICES

James M. Waroncelly

James M. Maroncelli, E.P. Environmental Chemist

Glenn N. Coffman, P.E.

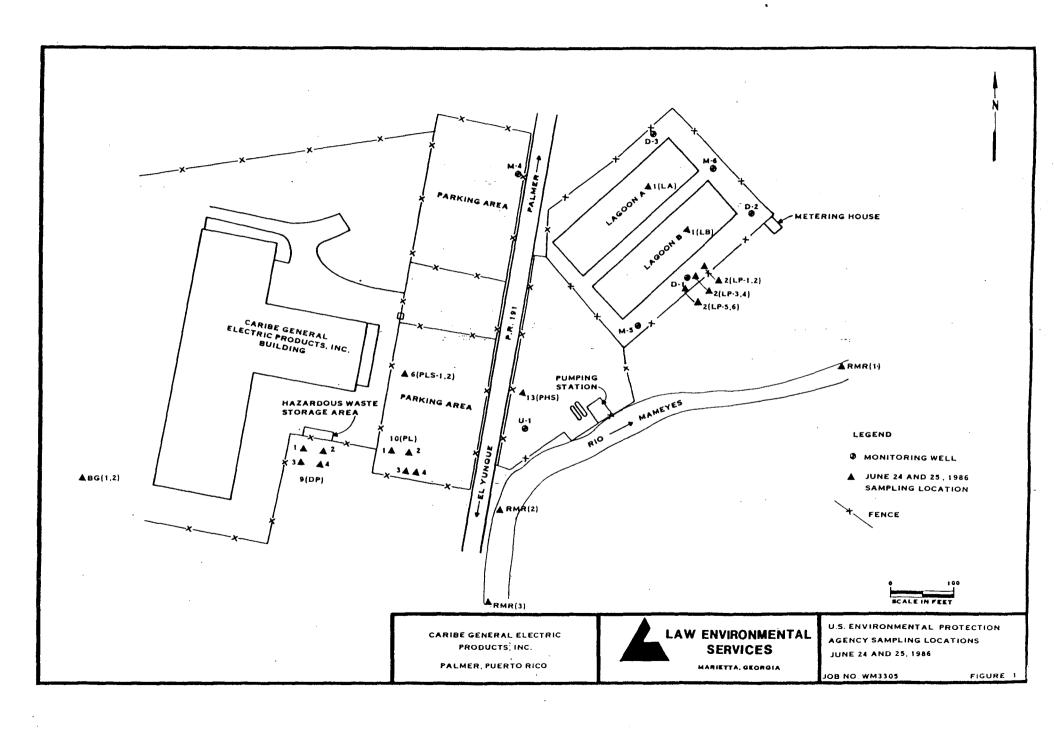
Senior Engineer

Puerto Rico Registration 9155

cc: Mr. Bill Gantt Ms. Milagros Ruiz

JMM:GNC/ddm





REFERENCE 7

CONSTRUCTION EQUIPMENT BUSINESS OPERATIONS

GENERAL ELECTRIC COMPANY • 41 WOODFORD AVENUE • PLAINVILLE, CONNECTICUT 06062• (203) 747/7111

February 10, 1986

Mr. Douglas Pocze Environmental Protection Agency 26 Federal Plaza - Room 400 New York, New York 10278

Dear Mr. Pocze:

We apologize for not mentioning and including information on the "Sludge Disposal Areas" as indicated on Figure 2 Appendix 'B' of the Closure, Post Closure Plans for Caribe-GE, Palmer, Puerto Rico. Although not mentioned in the plans, Law Environmental Services did conduct soil sampling and unalysis at both of the areas depicted in Figure 2 of the Closure, Post Closure Plans.

The results of the sampling and analysis for the area adjacent to the lagoons is presented in Appendix "I" of the Closure, Post Closure Plans for Caribe-GE, Palmer, Puerto Rico. The results of the sampling and analysis for the 'Sludge Disposal Area' located between the parking lot and the building can be found in the attached report 'Sampling and Analysis of Soil in Plant Area'. Also attached are copies of the results of the split samples and analysis conducted at the same location by the Puerto Rico Environmental Quality Board. Because the results from both of these chemical analytical agencies indicated that the soil tested is non-hazardous, this information regarding the 'Sludge Disposal Area' near the plant was not included in the Closure, Post Closure Plans for Caribe-GE, Palmer.

CAY INAD AMBIENTAD

FOR 18 1986

Area Control

Contaminación do

Terrenos



Briefly, the attached reports are the results of discussions with responsible management at the Palmer site. Upon discussion, it was determined that an approximate total of 200 pounds of sludge from plating tanks had on several occasions over a period of two years been placed in a drum for immediate pick up by a waste hauler. On these several occasions, the hauler missed the pick up date, resulting in a small amount of sludge waste being disposed of in the area of the plant as indicated in Figue 2. The sludge was left there and consequently absorbed by the soil. As a precautionary measure and to ascertain the level of soil contamination, soil analysis was conducted in this area. The results, as previously mentioned, are attached.

If this office can be of further assistance in this matter, please feel free to contact me.

Very truly yours,

/llc

Attach.

CC: EOB, P.R.

L. C. Peterson

E. Buso

A. Arroyo

G. Coffman-LES

1429

REFERENCE 8



January 21, 1986

MEMORANDUM

Τo

Eng. Jesús M. Medero

Director

Land Pollution Control

Area

Through

ng. Dulcilio Medina

Acting Director

Hazardous Waste Division

Yazmin López

Chief

Permits and Engineering Section

From

Roberto Berberena Jr. Environmental Specialist

Subject

G.E. PRECISION PROTECTIVE DEVICES (PALMER) SURFACE IMPOUNDMENTS CLOSURE PLAN (CP)

The above captioned facility recently submitted a CP for their electroplating surface impoundments. This impoundment have been inactive since 1981.

An evaluation to the submitted documentation was performed and I have considered that the CP needs to be revised since some information must be clarify. A period of thirty (30) calendar days has been granted to the company in order to submit the required information.

For more details of our evaluation see the notification to be sent to the company.

Mr. Manuel Sanchez General Electric Co. Precision Protective Devices, Inc. P.O. Box 377 Palmer, Puerto Rico

Rea Surface Impoundments
Closure Plan (CP)

Dear Mr. Sanchez:

Reference is made to the submitted CP for the proposed closure activities of G.E. Palmer's surface impoundments.

Our technical personnel has evaluated said CP and has determined that it is not acceptable since some information was missing or incomplete.

In order to approve your closure activities you must provide or clarify the following information within thirty (30) calendar days:

- 1- Submit a duly completed revised Part A; needs owner certification and signature; (provide a legible copy).
- 2 State the specific date when you expect to begin the proposed closure activities.
- 3- Submit an estimate of the maximum inventory of wastes in storage in the impoundments at any given time prior to the end of the operating life (1981) (265.112 (a) (2)).
- 4- Did you ever had a spill of the electroplating sludge from the impoundments? If you did, you must sample and proceed to decontaminate the surrounding areas if not, provide certification informing that no spill ever occurred.
- 5- Describe the procedures to remove the sludge and contaminated soil. How deep you will need (or you expect) to dig? Who will collect these materials? Give a complete description of the technical measures that will be implemented.